#1 Atari Computer Magazine

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Antic®

The ATARI® Resource

MARCH 1985 VOLUME 3, NUMBER 11

ULTIMATE PRINTER GUIDE

AtariWriter Secrets
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Picture Printing
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Microscreens

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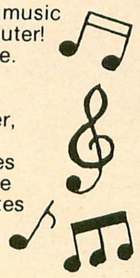
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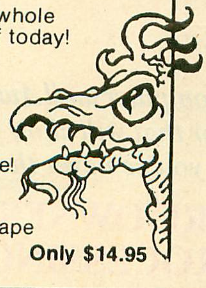
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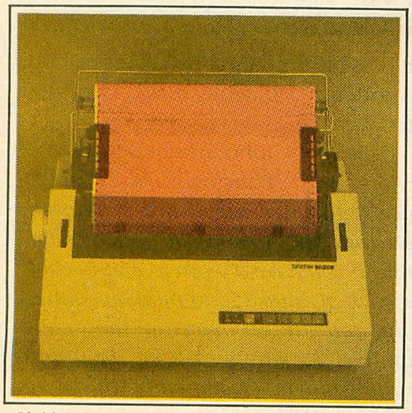
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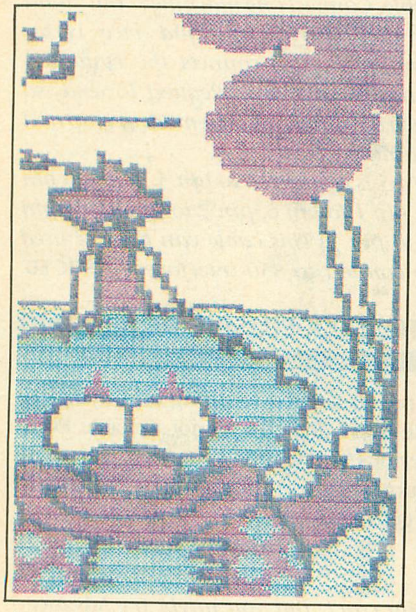
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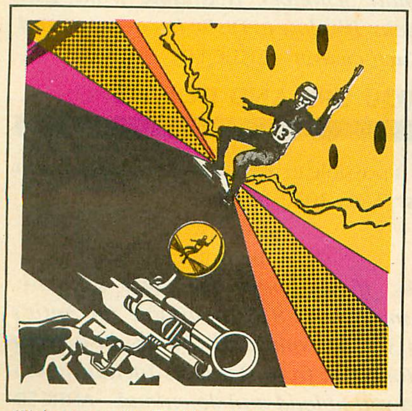
LOTSABYTES

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Antic®
The ATARI® Resource
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i/o board

QUIETLY WE AUTOBOOT

How can you make a program load automatically, without any keystrokes?

Mark Zackrison
Riverside, CA

When Atari DOS 2.0S is booted, it looks for a file named AUTORUN.SYS. If this file exists, it gets loaded into memory. If it doesn't, the computer is turned over to the cartridge or, if no cartridge is present, to DUP.SYS. The AUTORUN.SYS file must be a binary file written in machine language. (No, you can't call your BASIC program AUTORUN.SYS.)

To get a BASIC program to run automatically, you need a binary AUTORUN.SYS program which boots and then says "RUN D:MYFILE". Most of the **Antic** *public domain disks contain an AUTORUN.SYS file that will run any BASIC program named MENU. If you want to call your program something else, look at "Bootbuild" on page 49 of* **Antic**, *December, 1983.*—ANTIC ED

COVER COMMENTS

Just writing to comment on Alan Okomoto's cover illustration for the November 1984 issue.

Gorgeous.

Daniel Butler
New Berlin, WI

We agree with the readers who wrote us praising Alan Okomoto's lush, yet high-tech science fiction painting. It's just the look we like on Antic covers and you'll be seeing a lot more of Alan's work here — like this month, for instance!

—ANTIC ED

FUN WITH ART

I own an 800XL and the Fun With Art cartridge from Epyx. I tried to use the Atari SDUMP program from the January issue to print my pictures. I can't figure out how to use FWA with my pictures.

Todd Parker
Kingston, MA

SDUMP works with MicroPainter format files only. Use the Easy Graphics Converter program in Antic (September 1984) to convert FWA files to MicroPainter format. —ANTIC ED

LOOK—NO MODEM!!!

Is it possible to connect two Ataris without a modem? Do you need two 850 interfaces?

John Fronheiser II
Pottstown, PA

Once again, we asked Bill Wilkinson, who said "Yes." You need a "null modem" cable. If you have a 9-pin to 25-pin cable for each of your 850-to-modem connections, you can get one from most cable suppliers. Be sure to ask for the appropriate genders. (Technically, this is an RS-232-to-DB9 cable.)

Or you can make your own 9-pin to 9-pin cable. Connect one machine's "out" data to the other's "in", and vice versa. Similarly, cross connect the Data Terminal Ready" and "Request To Send" so each 850 thinks its own modem is up and running.

Pin 5 is connected to pin 5, pin 3 to pin 4, pin 1 to pin 6, pin 7 to pin 8 and pin 8 to pin 7. This cable can then be used to connect to 850 interfaces.—ANTIC ED

THE EVER-ELUSIVE DE RE ATARI

I procrastinated too long on buying **De Re Atari**, and now it's not available. Every serious article about Atari programming quotes or uses this as a source. Where can I get it?

David Miller
Green Clover Springs, FL

You can't. But you might try Advanced Programming Techniques for the Atari *by Linda Schreiber, available from TAB books. It's close to* De Re *in coverage, and much clearer.*—ANTIC ED

1030 UPS AND DOWNS

Is it possible to upload and download with my Atari 1030 modem?

Paul Kelm
Bloomfield, NJ

Yes, if you have the right software. Amodem 42.835, available on Antic's 1030 Telecommunications disk, and HomePak from Batteries Included both let you upload and download.—ANTIC ED

continued on page 8

i/o board

CABLING NIGHTMARE

I am having a problem with my disk drive. If I put it on a surface higher than my computer, it works fine. But if I put it on the same level as the computer, it doesn't work properly. What's going on?

Carl Cox
DCS Station
Donnersberg,NY

It sounds like a cabling problem. In fact, the first step in troubleshooting computer snafus is checking the cables. Is everything connected properly? Are there bent pins? Are all the ribbon cables smooth? Sharp angles and twists in ribbon cables cause problems. There shouldn't be any knots in your I/O cable.

Try switching cables. If you can isolate one that is not working, you've solved your problem.—ANTIC ED

BANNERTIZER

Readers' overwhelming response to John Bauman's "Bannertizer" program (**Antic**, December, 1984) produced several modifications.

Mark Hagen, of West Allis, WI, modified Bannertizer to print the character that is being bannertized. Change line 2040 to read:

IF (PIXMAP(PIXPOS)+INV=1) THEN S$=BANNR$(C,C):GOTO 2060

From Cuyahoga Falls, OH, Dick Croghan suggested a change that allows you to input the character from the keyboard:

10 DIM BINCOD(8),P$(80),S$(1),X$(1), PIXMAP(64),BANR (255),BANNR$(255), ROWMAP(8),Z$(1) 105 ?:? "INPUT A CHARACTER TO FORM THE LETTERS" ;:INPUT Z$ 2040 IF (PIXMAP(PIXPOS)+INV=1) THEN S$=Z$:GOTO 2060

If you're looking for letters made in a custom character set, try this suggestion from Derek Catt in Cincinnati, OH: With the custom character set in memory, change the 57344 in line 200 to the starting memory location of the custom set. This is found by PRINT PEEK(756)*256. The prompts and anything you enter during the program will still be in the normal character set unless you remove the graphics commands and change the PRINT #6 in line 4010 to normal print statements.—ANTIC ED

help!

DRUM SYNTH

In figure 1 of the Drum Synth article in February 1985, the key labelled "ART" should indicate the Atari logo (fuji) or inverse video key.

HELP FOR HELP!

February 1985's Help! section needs two corrections. The fix for line 4005 of "Advent X-5" should have a double quote mark before the C: The fix for "Adventure Island" should have a 4 behind the very last comma.

ADVENTURE ISLAND MEMORY

If you're getting an Error 2 (Insufficient memory) while running "Adventure Island" from our November, 1984 issue, it may be because you're using DOS-XL instead of Atari DOS 2.OS. "Adventure Island" is a big program and needs every bit of memory it can get. DOS-XL is a resident DOS and does not leave enough memory for this particular program.
—ANTIC ED

THE BIGGEST ON-LINE PUBLIC DOMAIN LIBRARY

by JERRY WHITE

You can become an active member of the largest Atari users group in the world—and have immediate access to a huge library of public domain software! It doesn't matter where you live. All you need to do is pick up your phone and dial CompuServe's Atari Special Interest Group (SIG).

Over 6,000 Atari owners use the Atari SIG. You can communicate on-line with any of them. You can also access **Antic**'s Electronic Edition from the SIG menu. (Or log on directly by typing GO ANTIC after the SIG function prompt.)

Antic on CompuServe brings you Atari news just as soon as it happens, a product review library, an open channel to **Antic** editors, excerpts of important articles and a look at upcoming magazine features.

THE BIG SIG

The Atari SIG has three sections:

- Message Exchange for electronic mail.
- Conference Area with 36 "CB" channels.
- Reference Library with more than a megabyte of downloadable public domain programs and information files.

It takes six system operators (sysops) to keep everything going.

To join in, you need a CompuServe membership, your computer and phone line, a modem with telecommunications software.

For information on becoming a CompuServe member, see your local computer dealer or call (800) 848-8199. In Ohio call (614) 457-0802. Access to services such as the Atari SIG at a standard 300 baud rate will cost you $6 per hour during the evening.

DOWNLOADING TOOL

And once you're on CompuServe, you can download hundreds of software titles—games, utilities, education, graphics and telecommunication programs.

One of the first on-line programs that you'll want to download is Tscope. Many of the other CompuServe programs can't be downloaded without it. Tscope also lets you view weather maps, stock charts and other graphics available on CompuServe. (Tscope is also available along with the excellent Amodem telecommunications program on an **Antic** public domain disk.)

GETTING ON-LINE

Once you've received your CompuServe Information Service (CIS) password, loaded your modem software and dialed the local CIS access number, you'll be ready to go.

Type [CONTROL] [C] and CompuServe will ask you for your personal identification number (PPN). Once you've entered your number correctly and pressed [RETURN], you'll be asked for your password. You will not see the characters you type for your password. This is a security measure to keep others from stealing your password.

Once CIS has received a valid password, you'll see an options menu. You can go to the Atari SIG by typing GO PCS132.

The first time you enter the Atari SIG, you will be asked if you wish to become a member. There is no additional charge for membership so type [Y]. Welcome to the group!

Do yourself a favor and read the New Member Information and Help files. There are quite a few commands and these take a while to get used to. But you can always get help by typing a question mark or the word HELP.

SUPER COMMUNICATION

You can also get information on any Atari-related subject from users anywhere in the country, or from the sysops by simply leaving a message.

Often, a message left overnight will surprise you—a simple request for programming help will produce a fantastic thread of responses from other interested Atari owners across the country. It's all there waiting for you at your next log-on!

Type [L] to leave a message. A prompt for the name and PPN of the

intended recipient appears as TO. To leave an open message to all members, type ALL, or to reach a sysop, type SYSOP.

The rest is straightforward. You'll be asked for a subject phrase before you type in the message.

You can then type your message using a simple word processing editor with special commands. But for now, just type as many as 80 characters for each prenumbered line and press [RETURN]. When your message is complete, press [RETURN] a second time.

You must now Save the message with an S# command. Instead of [#] you type the appropriate section number. Section numbers are used in the Message Area and Downloading Library to indicate subjects as follows:

0 General
1 GAMES & "T.L.S."
2 Telecommunications
3 Utilities/Applications
4 Sound & Graphics
5 Education
6 SIG*Soapbox
7 **HOT RUMORS**
8 SIG V.I.P. access

USEFUL COMMANDS

QS	Quick Scan of message topics
B	Bulletin reading
MI	Membership Information
OP	SIG Option changes
I	SIG command Information
M	Return to preview Menu
T	Return to Top menu
V	View membership interest file
OFF	Log Off CIS
CO	Access SIG Conference Area

Once you are in the Conference Area, you must use special commands that begin with a [/]. For help, type /HELP or to exit, type /EX.

To access the Reference Library for downloading programs, type XA#. Again, type in your desired section number instead of [#].

Uploading and Downloading can be a bit tricky so type [?] for help and read the help files carefully.

Once you're on the system, feel free to leave a message for **Antic**. Or chat with any of the sysops listed below:

Ron Luks	76703,254
Michael Reichmann	74015,1534
Steve Ahlstrom	70007,1657
Richard Brudzynski	74035,1550
Russ Wetmore	72435,1234
Greg Leslie	71565,235

*Jerry White is a contributing editor to **Antic** and a leading professional programmer of Atari software.*

KWIK DUMP

by JERRY ALLEN

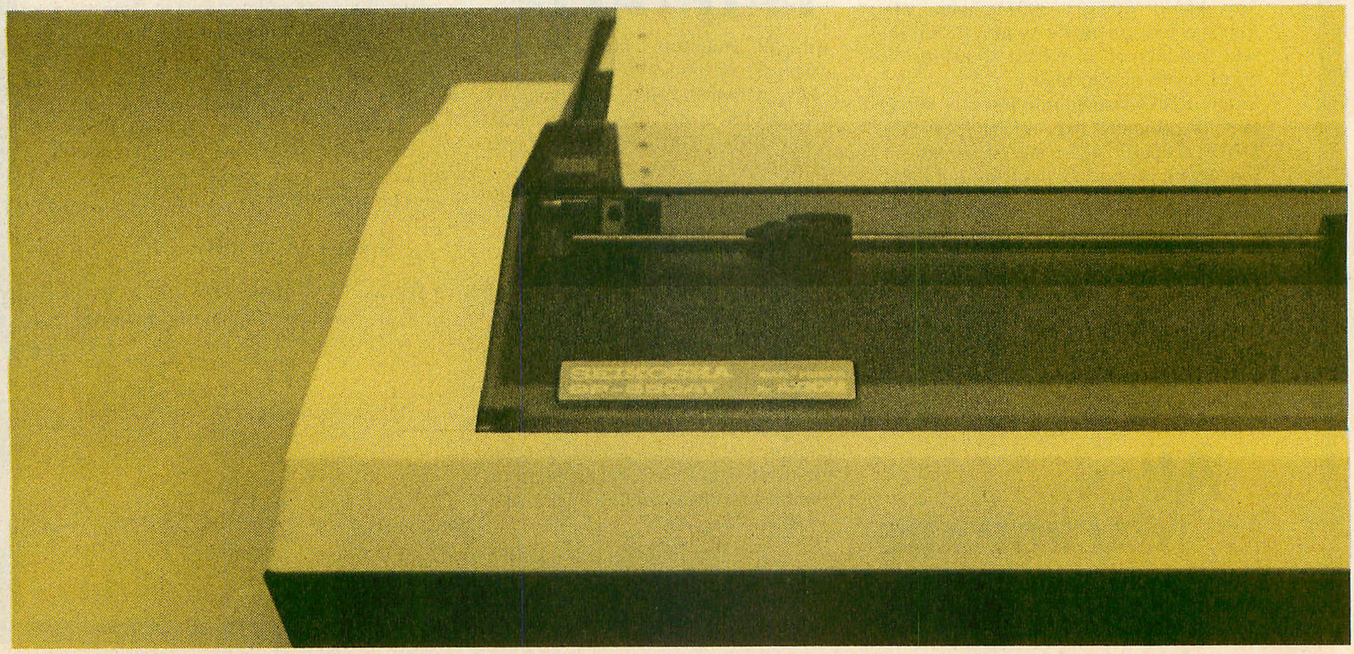
The screendump you've been waiting for

Kwik Dump is a fast screen dump BASIC program that works with most graphics disk file formats, including MicroPainter, Graphics Master, uncompacted Micro Illustrator and your own Graphics 24 (8+16) files. It will run on any Atari computer with a disk drive. Memory requirements vary depending on the graphics program. Most graphics capable printers can use Kwik Dump including: Epson, Gemini, NEC 8023, Prowriter 8510, KXP-1090, HP Thinkjet and DMP-80.

Antic receives many letters requesting a good screen dump for one printer or another. So we got the job done by a top pro in Atari printing software, Jerry Allen of Allen Microware. We figured that if the creator of **PRINTWIZ** couldn't come up with something outstanding for **Antic** readers, nobody could.

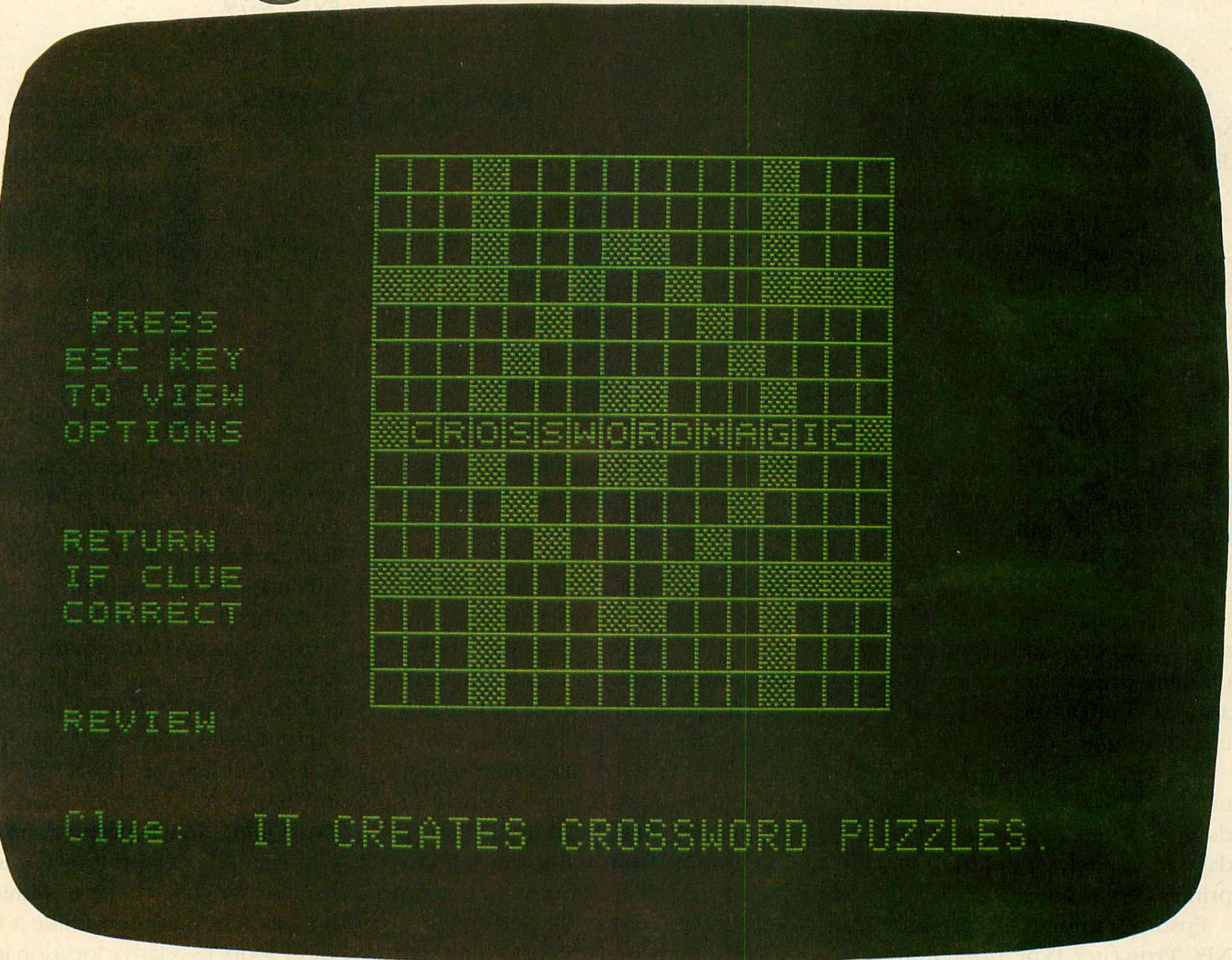
Jerry did not disappoint us! He provided an article that explains the programming of printer graphics dumps, plus two programs. Kwik Dump is listing 1, which loads your picture into memory and then dumps it to your printer. Listing 2 adapts the Kwik Dump loading routine for saving your own screens. Type in both listings. Check them with TYPO II, then save them to disk. Listing 1 will work with all the printers named in the synopsis above. If you're using any of the various Micro Illustrator programs out there, including the Koala Pad or Atari Touch Tablet versions, you must use uncompacted files which can be created by pressing [INSERT] while the picture is on the screen. (See "'Easy Graphics Converter", **Antic**, September, 1984.)

continued on page 14



LINDA TAPSCOTT

Only one program lets you create your own crossword, instead of filling in someone else's.



Compatible with Apple,® Commodore,® IBM® and Atari.®

Crossword Magic is just like the crossword puzzles you see in the newspaper. It has the same crossword format. And the same crossword clues.

Yet, it's totally unique. (After all, does it make sense to spend $49.99 for something you get in your newspaper for a few cents?)

Here's the twist.

Crossword Magic lets you create your own puzzles from scratch. Not only is this fun, but it's also educational. You can use it to test yourself and others on any subject. For example, will they remember that a "protozoan with pseudopodia" is an amoeba?

Now *that's* worth $49.99.



Crossword Magic from Mindscape

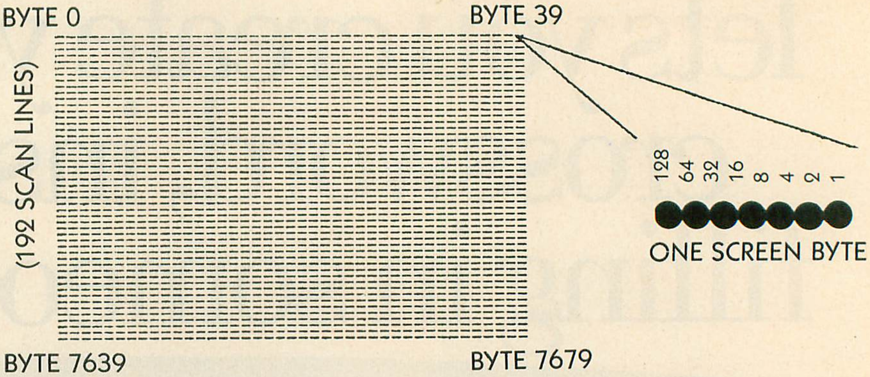
MINDSCAPE INC

Mindscape, Inc., 3444 Dundee Road, Northbrook, IL 60062. For more information, call 1-800-221-9884. In Illinois: 1-800-942-7315. Price listed is manufacturer's suggested retail price.

KWIK DUMP
continued from page 12

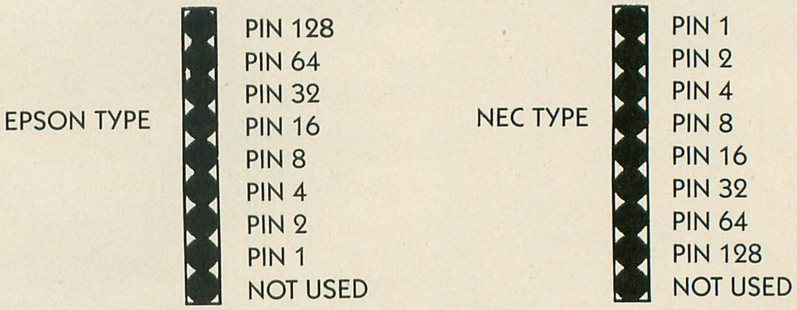
Figure I

SCREEN RAM LAYOUT



NOTE: Even if you're an Atari programmer who doesn't own a disk drive or a dot matrix printer, Kwik Dump is well worth your close study. It's an example of clean, elegant, professional programming that you'll rarely see printed in a magazine.—ANTIC ED

PRINT HEAD VALUES



Probably the easiest screen dump to program is a vertical dump for Graphics 8+16 files. This is because all of the screen data can be used directly. Horizontal and mixed mode screens require much more complicated programming in order to achieve similar (though often more useful) results.

The only important criteria you need to know for a Graphics 8+16 dump is where to start retrieving the data in memory, and the specific printer set-up codes.

Epson/Gemini type printers and NEC/Prowriter type printers have 9 vertical pins in their print heads. They both use only the top 8 pins for graphics modes. The similarity stops here. The values for the top 8 pins are exactly opposite. The Epson top pin has the value 128, the bottom pin is value 1. NEC types have the top pin as value 1, the bottom pin is value 128.

Screen RAM bytes for graphics 8 are arranged in horizontal value with the leftmost bit of the byte equaling 128 and the rightmost bit equal to 1. When a bit is on, the dot is lit. These are the dots we wish to print.

A byte with the value of 129 would print a dot, 6 blank dot-size spaces, and another dot. If the screen is turned 90 degrees, you see that these bytes can be used directly by the printer. The only problem is that if you don't start in the right place, the picture may come out backwards or upside-down.

So, by studying the screen layout, we can deduce that Epson compatible printers should start retrieving data in columns from the lower left corner of the picture, bottom to top and left to right across the screen.

NECs and compatibles should start at the upper right corner in columns from top to bottom and right to left across the screen. *Figure 1* illustrates this. The rest is simply using the proper initialization codes from the printer manual and some relatively simple BASIC.

SPEED FACTORS

The two factors that affect printing speed the most are retrieval of data from screen RAM or memory, and sending the data to the printer. Since a printer operates much slower than data can be sent, even by BASIC, the only critical time element which can be changed is data retrieval.

In screen RAM the bytes are not stacked as in *Figure 1*. Therefore to find each byte BASIC must add or subtract 40 bytes, times 192 scan lines, times 40 columns. FOR-NEXT loops and BASIC math routines make this a very long-drawn proposition.

In Listing 1, A$ on line 140 is the machine language code to minimize the data retieval time. Unlike a FOR-NEXT loop, its relative location in the program is not very critical due to its speed. Similarly, LOD$ on line 130 speeds the byte data retrieval process from the disk and into RAM.

In listing 1, LOD$ takes over *after* the file is opened and the screen is set to Graphics 24 (8+16). It then uses CIO, Atari's Central In-Out machine language interface, to load the 7680 bytes. A$ contains the math routines for both Epson and NEC type printers to move a vertical stack of bytes to the

temporary buffer which is PRNT$.

CHOOSE A LINE

When typing in listing 1, lines 130 and 140 may be difficult to enter correctly. The reason they are written this way is to make the program load and run faster than by using data statements each time. Lines 120 and 1000–1100 were put into the program to make typing easier. If you can type lines 130 and 140 with no problem, then don't type in 120 and 1000–1100. If you feel insecure about typing in the special characters directly, type in 120, skip lines 130 and 140, and type in 1000–1100.

If you choose the latter, the first time the program is RUN lines 130 and 140 will automatically be formed as characters on the screen. Also, the lines to be deleted will be placed on the screen. Move the cursor over number 120 and press [RETURN] continuously until all of the line numbers are entered or deleted. SAVE your program again at this point. When you RUN the program again, the above procedure will not be necessary.

CHANGING IT AROUND

When typing in the listings, all REM statements may be omitted. For your own purposes the disk load routine could easily be replaced with a graphics drawing program. The printer codes at line 600 could also be modified to set up codes for slightly different printers or to modify aspect ratios.

As a suggestion you might set up the print routine to send a string of spaces at line 420 prior to the graphics code and graphics data, thereby centering your picture. Try to avoid breaking up line 420 if you try the above. Keeping the FOR-NEXT loop on one line makes it run faster. You can accomplish this by defining a string variable, with a short name such as C$, to a line of spaces during the program initialization.

When RUN, listing 1 will ask you which type of printer you are using. Then it prompts you to insert your picture file disk into drive 1. Press [RETURN] when ready. After the directory is up, type in the name of the file you want to dump. Entering the "D:' or "D1:' is unnecessary. 'D2:' may be used, but you will not be viewing its directory.

At this time the picture will load onto the screen and be dumped to the printer. Make sure the printer is online prior to calling up the drawing. Input and device errors are briefly announced and the program will restart if an error occurs. If not, after the dump the screen remains up until you touch any key. Then the program goes back to the directory routine.

LISTING 2

Listing 2 is included to provide a quick and dirty (but interesting) picture file to dump. It also demonstrates SAV$, which is the same as LOD$ in listing 1 except for the third character (byte).

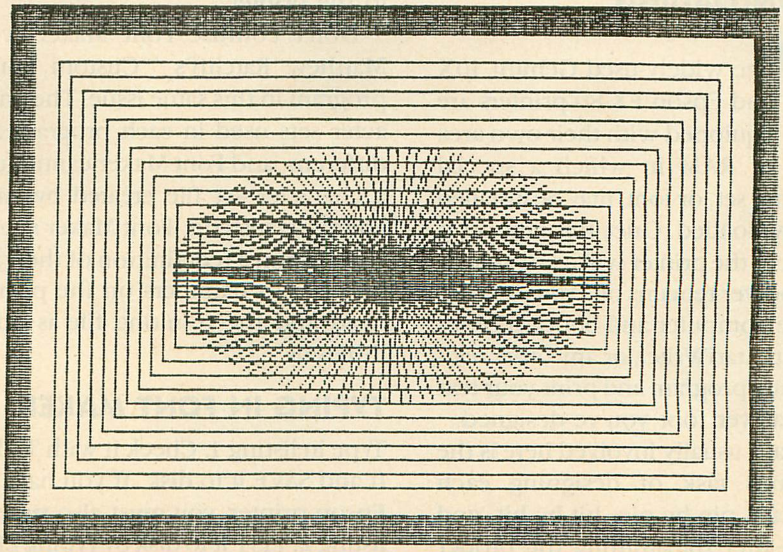
In SAV$ the third character is a [CTRL] [K] instead of [CTRL] [G] in LOD$. If you already have listing 1 running, LOAD it. Clear the screen and LIST 130. Type NEW [RETURN]. Move the cursor over the line and change the third character to a [CTRL] [K]. Press [RETURN]. LIST or SAVE that line. Or continue to type in the rest of Program 2 and then SAVE it.

When RUN, listing 2 draws a fairly quick Graphics 24 picture and SAVES it to disk. The file can then be dumped using listing 1. Since no error checking is done, make sure to have an unprotected disk in drive 1 with at least 62 free sectors prior to running the program. The file it saves to will be named PIC.DAT. You may then dump PIC.DAT using listing 1.

SAV$ can be used as-is in many of your home-brew programs. Just ENTER it making sure that you DIMension it and that line numbers don't conflict. The other routines from listing 1 can be used in much the same way. Just LIST the needed lines to disk. Change the lines in the LISTed file prior to ENTERing them into your already loaded new program. Then SAVE or LIST the whole conglomeration.

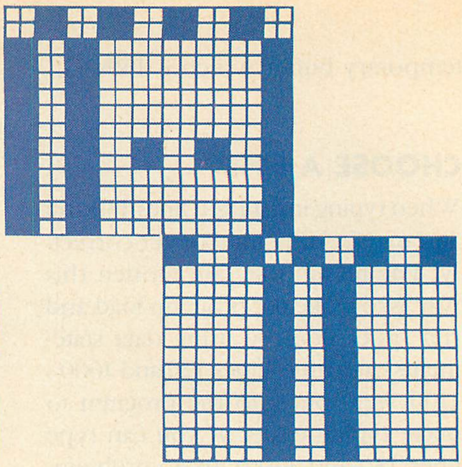
Jerry Allen lives in Southern California where he is an engineer at TRW and operates Allen Macroware software publishing (P.O. Box 2205, Redondo Beach, CA 90278). Allen's ***PRINTWIZ*** *($29.95, 16K disk) is a 100% machine language dump for all graphics modes and mixed modes. Its horizontal format allows large continuous text. You can change widths and heights, center automatically, invert, make partial dumps and more. It works with BASIC, assembler, Logo and PILOT and is configured for most popular printers with a parallel interface. Included is a text lister for dumping Atari special characters.*

Listing on page 59



Listing 2 picture file

FONT MAKER



Design your own character sets

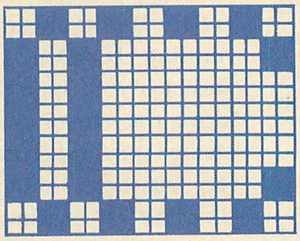
by JAMES DUFFIN

Design custom font sets for downloading to your Epson FX-80 or Gemini 10X printer. Once the new fonts are installed in the printer, your Atari can be turned off without losing this new character set. You can then re-boot any word processor or printer program, for printing out in your newly designed font. Font Maker works on all Atari computers, but requires 48K, a disk drive, BASIC, and a joystick.

CHARACTER SET DOWNLOADING

The widely-used Gemini 10X and Epson FX-80 printers are equipped with their own area of RAM in which a special character set, or font, may be installed or downloaded. Once this new set is installed, the printer will use it as long as its power remains on. You can turn off the computer and boot up Letter Perfect, AtariWriter, or any other text-handling program and print your text in whatever font you've designed.

What's usually involved here is the laborious task of designing each character, pin by pin, bit by bit, and then—after transmitting the proper set-up codes—sending all the data for each character to the printer. If you've ever tried to follow the process described in your printer manual, you probably gave up before very long.



Font Maker is a combination of character set editor and printer loader which should simplify both tasks. The program can be used to design a set which is then saved to disk. The resulting disk file can later be recalled by Font Maker and downloaded again to the printer.

Don't confuse Font Maker with Matthew Ratcliff's "Custom Font" program in this same issue. The character sets used in each program are different, and Font Maker cannot use a character set file created by such editors as Instedit. Font Maker's set is based upon a redefinition of the 9 × 7 grid of pin hammers on the printer head and the resulting file is quite different.

TYPING IN FONT MAKER

Type in listing 1. Check it with TYPO II and SAVE it to disk. If you have an Epson printer, you must also type in listing 2. LIST it to disk by typing LIST "D:FILENAME". LOAD listing 1 then ENTER listing 2 and, finally, SAVE the merged program to disk. This is the program you will use. Epson owners should also turn DIP switch 1–4 to the **off** position (See your manual). This will turn off your 2K buffer and allow it to be used for the new character set.

USING THE PROGRAM

When you RUN Font Maker, a screen of brief instructions will appear. Press any key to get to the editor screen.

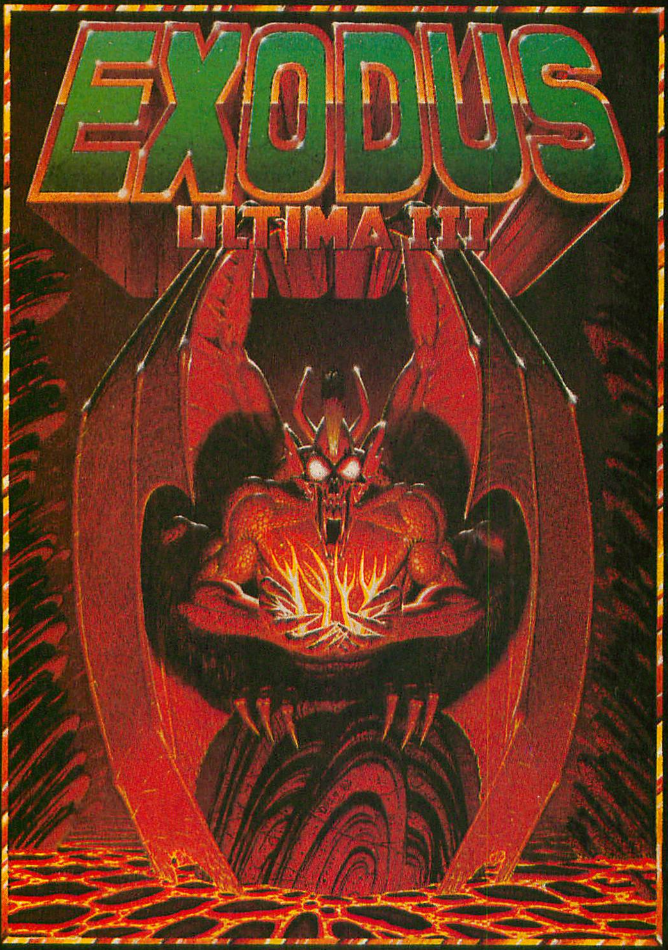
The character set on the lower part of the screen shows the printer characters available for editing. Use the joystick controller to move the cursor to the character that you wish to edit. Press the joystick button and the cursor will appear in the dot matrix box in the upper left corner of the screen. The character in the lower set becomes inverse to indicate that it is being edited.

The joystick now controls a cursor in the dot matrix box. The box is empty until you start editing. Press the button to place a dot or remove a dot. Horizontal rows of dots must have a space between each dot, but vertical columns don't need spacing.

See *Figure 1* for an example of the letters in the word **Antic** as redefined

continued on page 18

"A LIVING TAPESTRY . . ."



"The world of Ultima III can only be compared to a living tapestry — complex and beautiful . . . This is the best fantasy game in computing. Indeed, it is one of the best fantasy worlds in which to live. Lord British is a veritable JRR Tolkien of the keyboard." — Popular Mechanics

"Exodus: Ultima III, with a superior plot to match its superior gaming system, is a great game. It upgrades the market; in several ways it sets new standards for fantasy gaming state of the art." — Softline

"Exodus: Ultima III is Lord British's magnum opus — so far. It's fun and exciting to play and constantly intriguing. And the ending is marvelously unexpected and not a bit disappointing — except that it is the ending, and as with a good book, you'll probably wish there were more." — Softalk

Available on: Apple, Atari, Com64, IBM

ORIGIN SYSTEMS INC. 1545 OSGOOD ST., #7 NORTH ANDOVER, MA 01845
(617) 681-0609

FONT MAKER
continued from page 16

for a special set which is included on the **Antic** subscriber's disk as DECOGEM.FNT for Geminis and DECOEPS.FNT for Epsons. Before attempting to create an entire set, practice by redefining just these letters.

When you have completed your new dot pattern press [E]. The code for the new character will be stored in memory, and a representation of the edited character will appear at the bottom of the screen. The cursor now returns to the character set to select the next character for editing. Should you decide to re-edit any of the characters from the bottom set, their pattern will first be transferred to the matrix box.

You do not need to redefine all the characters. At any time during the editing process, you may press [START] to download your font to the printer. This takes some minutes, so be patient. Turn up the volume on your TV and you can hear the data being transmitted. Upon completion, you will be given the option of printing the entire set to the printer. Whichever you choose, you can now boot any program and, as long as printer power remains on, all printouts will be done in the new font.

FONT MAKER COMMANDS

The following commands may be executed at any time:

[S] saves the font to a disk after prompting you for a file name.

[L] loads a font from disk after prompting you for a file name. If you're an **Antic** disk subscriber, you can load the DECO font as described above.

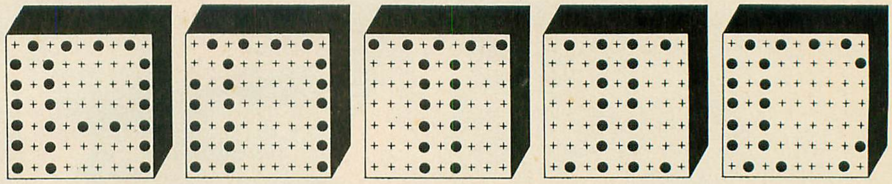
[D] toggles the descender mode on and off. If you wish to edit a character such as a "g" or "j", turn this on and the character will be printed two dots lower than normal.

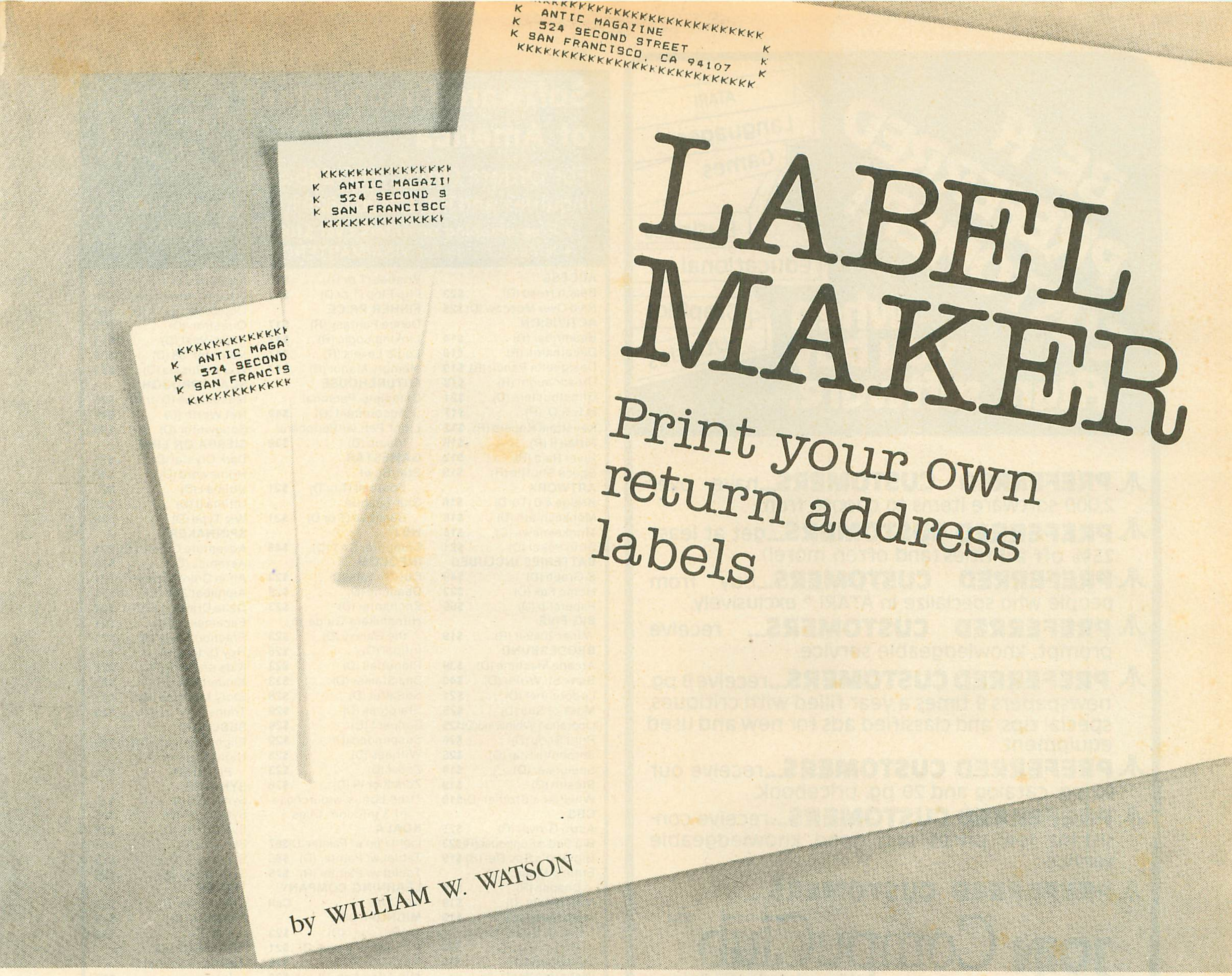
Use up to 8 characters for the file name and be sure and use the extender .FNT because the directory routine will only show those files. If you wish to use a different extender, alter line 2020 accordingly.

James Duffin, Ph.D. is an Associate Professor of Anaesthesia and Physiology at the University of Toronto, Canada. He's been programming for three years on an Atari 400, which has been customized with 48K and a keyboard.

Listing on page 54

Figure 1





LABEL MAKER

Print your own return address labels

by WILLIAM W. WATSON

Let's say you just ordered 500 return address stickers from one of those coupon sections in the Sunday paper. Then two weeks after the labels arrive in the mail, your company transfers you to Minot, North Dakota.

Well, no need to worry any more. With the Label Maker and your Atari, your printer can turn out an unlimited labels. Print out a few for your Aunt Betty, or for Uncle Harry who keeps telling you that the Atari is just a toy.

Type in listing 1, checking it with TYPO II, and SAVE it to disk or cassette. Later in this article we'll explain how to use Listing 2, which prints larger labels.

For this program to work, you need a dot matrix printer capable of printing in both condensed and super-supply of fancy-trim return address

Now you can print tiny return address labels with fancy borders, just like the ones sold in mail-order catalogs. This short BASIC program will run on any Atari. As written, it's for a Gemini 10X printer. But the article explains how Label Maker can easily be modified to work with any dot-matrix printer that prints condensed and subscript lettering.

script modes. It should also be able to handle size 3.5″ × 15/16″ (single width) labels with tractor feed sprocket holes.

PRINTER ADAPTATION

The program as written is for a Gemini 10X. To adapt it for your own printer, you need to change the codes in line 620.

Presently, line 620 contains the Gemini printer codes for condensed and superscript lettering. This gives you the smallest type available from the printer. The condensed print code is CHR$(15). The setting for superscript is CHR$(27); CHR$(83); CHR$(0). Then CHR$(51) and CHR$(12) set the line feed to 12/144 inches.

You'll have to find the comparable codes from your own printer manual and substitute them for the line 620 settings shown above. For example, with an Epson FX-80 simply change the CHR$(12) to CHR$(18). The codes for both condensed and superscript are identical on both printers. But the Epson's line feed codes are counted in 216th of an inch instead of the Gemini's 144th of an inch.

USING THE PROGRAM

Now load your label paper into your

continued on page 43



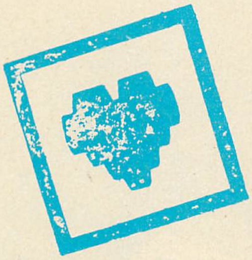
CUSTOM PRINT

Now—print those special Atari characters

by MATTHEW J.W. RATCLIFF



With Custom Print you can make complete printouts of your programs or text files—printing any character in the Atari special set. The BASIC program can also load a custom character set file for later printing. Custom Print works on all Atari computers with 32K, BASIC, and a disk drive. It is compatible with the Epson, Gemini or, with the modification listing, the NEC or Prowriter printer.



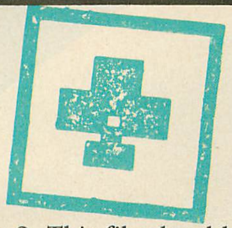
Finally. . .you correctly typed in that impossible machine language string that **Antic** insisted on publishing. But when you tried to LIST the program to your printer, it reached the line with the crazy characters and began a continuous form feed until you shut off the power. So, how do you make your own printout of "Biffdrop"?

Custom Print uses your printer's graphics capabilities to print an ATASCII file. (This means your program must have been previously LISTed to disk.)

Antic Disk subscribers have a pair of bonus character set samples. The files are titled COMPUTER.SET and STYLISH.SET.

TYPING IN CUSTOM PRINT

Type in listing 1, checking it with TYPO II before you RUN it. If you have a NEC or Prowriter printer, also type in listing 2. This file should be LISTed to disk. Load the first listing, then ENTER listing 2. Save this merged file before RUNning it. (Note: The original program contained a rather long machine language string which has since been changed to data statements for easier typing. This will cause a slight initialization delay. The more adventurous of you may wish to change this back.— ANTIC ED)



USING CUSTOM PRINT

The program will ask if you want to print with a custom character set (c-set), Atari's c-set, or the last set loaded. If you load a c-set you will be asked for the disk drive number 1–4 that your c-set file is on. A directory for that disk will be displayed on the screen.

You are then prompted to input the filename of the c-set to load. Type the name only, do not type the device D:. If the file selected is not there the error is flagged and the filename is requested again. To refresh your memory, or to get a directory of a different disk (and different drive if desired) just press [RETURN] here to go back to the drive number prompt.

Once a good c-set filename is inputted, all of Atari's characters are printed to the screen. The new c-set is displayed as it is loaded. This only takes a few seconds, so don't blink. The routine even checks for valid c-set files. A c-set for the Atari is 1024 bytes long. If the file loaded is not exactly that length, an error will be flagged and the program will restart. InstEdit by Sheldon Leemon is the best commercially available c-set editor in my book. (See our catalog in this issue.— ANTIC ED)

continued on page 42

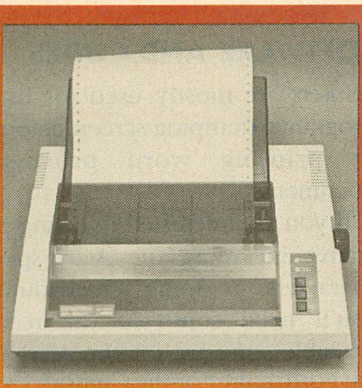


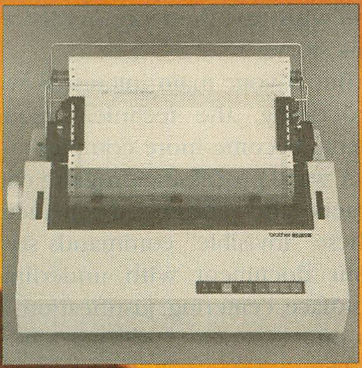
PHOTO: LINDA TAPSCOTT

ANTIC 1985 PRINTER GUIDE

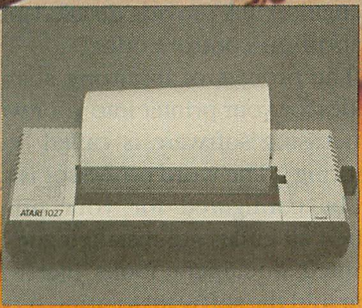
Choosing the best printer for you!

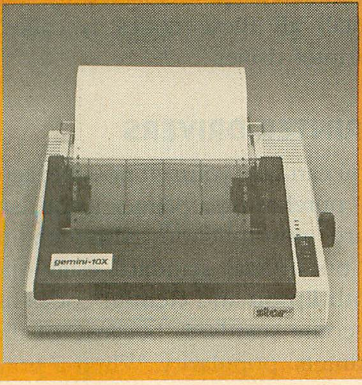
by MICHAEL CIRAOLO
Antic Associate Editor











No one ever said choosing the right printer would be easy, even if it is the first peripheral you add to your computer and disk-or-cassette storage device.

Dozens of printers on the market can be hooked up to your Atari. You've got several different printing technologies to choose from. So what's the best printer for you? As usual, what's "best" really depends on what you need.

Instead of bringing you short reviews of every Atari-compatible printer we could find, **Antic** *thought it would be more useful to go into more detail about the printers that seem to be most widely used with the Atari and its word processing software. We also selected enough other good printers to give you a choice at different prices. All printers reviewed were fully tested by* **Antic** —ANTIC ED.

WHAT YOU NEED TO KNOW

PRINT QUALITY

There are currently two standard printer formats, dot-matrix and letter quality, representing several technologies.

Dot-matrix printers use pins or wires as tiny hammers to strike an inked ribbon against paper and form each letter out of a pattern (matrix) of dots.

The quality of dot-matrix printer lettering varies widely. Early dot matrix letters typically looked like a bunch of dots with lots of space in between, the stereotype "funny computer printing."

By now, most dot-matrix printing is "correspondence quality,"—individual dots are closer together or touching. Text is very readable, even if it still looks different from typewriter letters.

Dot matrix printers have three advantages. They're fast, they usually cost less than letter quality machines and they're the only type of printer versatile enough to print graphics or highly customized characters.

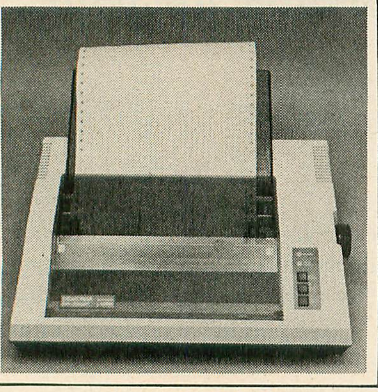
On the other hand, letter quality printers have one significant advantage—their printing looks exactly like it came from an office typewriter.

Most leading letter quality printers use a daisy wheel, a flat disk with over 100 spokes. Each spoke contains a character, which is hammered against a ribbon to create a one-piece image on the paper.

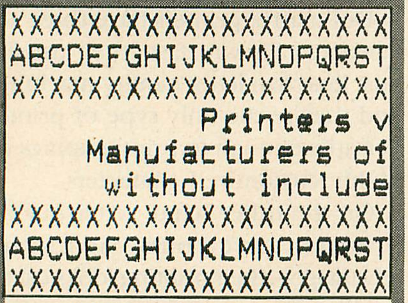
If you want different lettering fonts, you can simply change daisy wheels. Depending on which dot-matrix printer you select, you may well be able to program new fonts with ready-made software. Because daisywheels must be changed while the printer is stopped, only dot-matrix printers allow you to change fonts within a line of text.

Some features can be found in both types of printers, but are not necessarily in *every* printer. These include proportional spacing, subscript and superscript, variable pitch (the number of characters per inch).

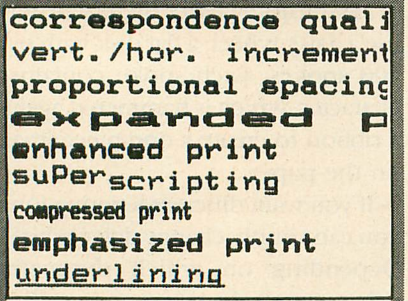
continued on next page



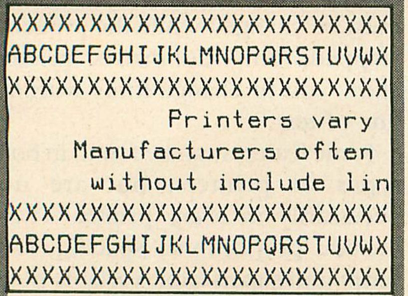
Axiom GP-550AT



Print sample from Axiom



Print sample from Okidata



Print sample from ThinkJet

You also get a choice of paper feed methods. Friction feed is the familiar typewriter method, the paper is held by rollers pressed tightly against the platen. Tractor feed allows you to use the fan-fold computer paper with holes at the sides, and adjustable tractor feed lets you print labels.

CABLES AND INTERFACES

In this world without universally accepted computer standards, it's not easy to escape compatibility hassles.

This can get especially aggravating when you're setting up a printer. Because here you have an extra consideration—the special cables that connect your Atari and the printer of your choice.

Computers are connected to printers by cables. Many first-time printer buyers are shocked to find that these cables usually cost extra—$30, $40, $50 . . . Not only that, it's often necessary to hunt around for the right cables because they're not manufactured by either the printer or the computer company.

All a cable really does is transfer electrical signals from the computer to the printer in patterns the printer can translate to letters, numbers, punctuation, spaces, carriage returns, etc.

Printer cable plugs come in standards called either RS-232C (serial), or Centronics (parallel). Or they may be in non-standard formats set by certain computer manufacturers . . . including Atari.

Depending on what printer you choose for your Atari, you may need an interface. This can be the hard-to-find Atari 850, which will require a separate printer cable. Or you can get a combination of cable and interface, like the **MPP Microprint**. Most interface devices are designed for parallel printers, and plug right into your Atari's peripheral ports. Adjoining this story you'll find a list of these proven products.

One thing to watch for: if you have any peripherals with only one port (such as the Atari 410 cassette recorder) make sure the printer interface provides you with a second port for complete daisychaining.

SOFTWARE AND CODES

Printers are mostly used for listing programs, dumping screen graphics, or printing word processing documents.

If you are interested in listing programs, including the Atari special characters, or doing screen dumps, you'll need some of the readily available software for the Atari. See the **Fontmaker** or the **Custom Print** articles in this issue or, for more "bells and whistles", the accessory list with this story.

But if your main interest is word processing, the technical requirements become more complex.

A word processing program enters letters and command characters. These "invisible" commands stylize your document with underlining, boldface, centering, justification, and so on.

The command characters must be communicated to your printer by control codes. A good word processing program offers you some sort of step-by-step menu to permanently enter the control codes needed for your printer.

You find the correct control codes in your printer manual, usually listed in hexadecimal or ASCII format. Any printer listed in this issue's chart as having "good" or "excellent" documentation will provide detailed information on control codes.

The process of inputting a set of codes for your printer into your word processing software is called "configuring". The word processor is said to be configured for your printer when all codes are installed and the printed document looks like what you told the software to print. A configuration program that allows you to install all these codes is called a "printer driver."

PRINTER DRIVERS

You can save yourself possible agony by purchasing a printer using "standard" control codes. Although there is no official standard established, both Epson and Gemini codes have become standards because of these printers' popularity. When a printer

is described as being "Gemini (or Epson) compatible," its control codes should be the same as those printers. If your printer is standard, you should be able to configure your system by simply selecting the make of your printer from a program menu.

We cover the compatibility of control codes for all printers reviewed in this issue.

Another factor that may be necessary for correct configuration is the proper setting of the "DIP" switches. These are banks of tiny switches, either inside or outside your printer, which control various functions such as line feeds or buffer allocation, depending upon the printer design. Again, a printer that comes with good documentation will explain exactly what is required.

DOT-MATRIX PRINTERS

AXIOM GP-550AT

The **Axiom GP-550AT** ($319), made by Seikosha, offers instant connection, plugging directly into your Atari peripheral ports. It is less expensive than other dot-matrix rinters, yet offers a variety of fonts and pitches. The GP-550AT can print text or high-resolution graphics. It also underlines, prints subscript and superscript. Both friction and adjustable tractor feed are provided.

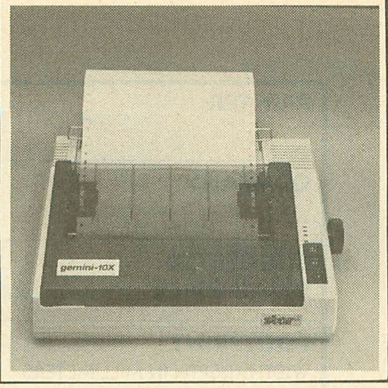
The GP-550AT is also slow and noisy, but these are neglible shortcomings given the low price. More significant is that its print quality is not impressive.

OKIDATA 92

Also known as the **Okidata Microline 92** ($440), this is a favorite of many Atari owners.

The Oki does all of the standard dot matrix tricks—superscript and subscript, expanded and boldface print, proportional spacing and correspondence quality printing, and so on.

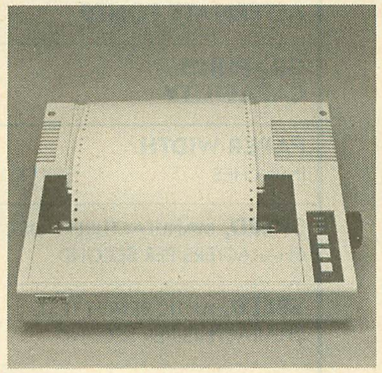
It is slower than more expensive dot matrix printers, but also slightly quieter. However, it makes a high pitched sound which could be irritating to some.



Gemini 10X

```
XXXXXXXXXXXXXXXXXXXX
ABCDEFGHIJKLMNOPQRST
XXXXXXXXXXXXXXXXXXXX
          Printers v
  Manufacturers of
    without include
XXXXXXXXXXXXXXXXXXXX
ABCDEFGHIJKLMNOPQRST
XXXXXXXXXXXXXXXXXXXX
```

Print sample from Gemini



Epson FX-80

```
XXXXXXXXXXXXXXXXXXX)
ABCDEFGHIJKLMNOPQRS1
XXXXXXXXXXXXXXXXXXX)
          Printers \
  Manufacturers of
    without include
XXXXXXXXXXXXXXXXXXX)
ABCDEFGHIJKLMNOPQRS1
XXXXXXXXXXXXXXXXXXX)
```

Print sample from Epson

The mean-time-between-failure, or reliability, is twice that of the Axiom.

But the print density for graphics is less than other printers. This is significant, because it determines the appearance of a graphics dump. The more dots per inch, the better the picture's resolution and appearance.

HEWLETT-PACKARD THINKJET

Ink jet technology is a recent addition to the printer scene. An ink-filled cartridge sprays ink onto special paper to form each character with the appearance of a good dot-matrix printer. The $7.95 cartridge replaces conventional ribbons and printheads.

The **Hewlett-Packard Thinkjet** ($495) was the smallest, fastest and quietest printer we reviewed. Epson-compatible, it is built HP tough. However, it does have a few drawbacks, including its need for a high-absorbency paper which is slightly more expensive than ordinary paper and must be ordered from HP.

If you print long files, say 30 pages, the ink cartridge gets clogged and needs to be wiped. Finally, all paper feed is accomplished only by membrane buttons, so manually adjusting the paper is difficult.

GEMINI 10X

The **Gemini 10X** ($549) is a favorite around the **Antic** office for its all-around versatility coupled with low cost and a work-horse disposition. It prints our labels, listings, memos, and articles.

The Gemini has all the features made standard by Epson—expanded, condensed and bold script, superscript and subscript, and so on. You can download character sets to the Gemini, and use it for graphics dumps.

Both the Gemini and the Epson are regarded as standards for the dot-matrix industry, but there are a few differences worth noting. The Gemini uses a standard two-spool typewriter ribbon—an easier-to-find ribbon could not be had. The Gemini comes with adjustable width tractor feed,

continued on page 28

PRINTER CHART CATEGORIES EXPLAINED

Footprint refers to the desktop space the printer occupies, its width and depth.

Proportional spacing is the kind of typesetting used in professional publications. In contrast, standard typewriters leave the same amount of space around wide letters (M,W) as narrow letters (I,l).

Variable pitch is the ability to print different amounts of characters per inch (pitch).

Alternate fonts are available with most dot-matrix printers. You can change fonts with some daisywheel printers by manually switching the print wheel.

Graphics capability is measured in dots per inch—the more dots, the higher picture resolution.

Speed as measured by manufacturers (in characters per second) is generally faster than the actual time it will take you to print a document. The Antic test reflects real printing conditions, such as boldfacing and carriage return times.

DIP switches are found on most printers. Some allow you to change the data transfer settings, others load alternate character sets. The number of switches indicates the flexibility of the printer.

Noise rating is somewhat subjective. The Epson and Gemini are similar, although the Gemini is higher pitched. The Axiom and Atari are the noisiest of the bunch.

Mean time between failures, head life and ribbon life are all measures of reliability supplied by the manufacturer.

Documentation: Abysmal means a 6–page sales brochure that tells you nothing. Adequate means someone published the technical notes as is. Good means you'll easily find everything you need to know, and then some. Excellent means Epson went an extra step and included a 320–page book with their printer at no extra charge, with programs and project ideas.

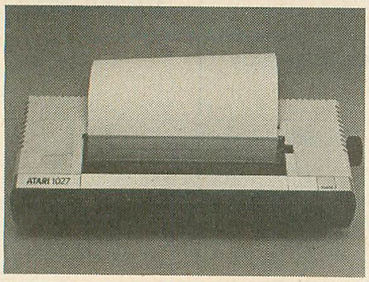
PRINTER	AXIOM GP-550AT	OKIDATA 92
COMPANY*	AXIOM CORPORATION	OKIDATA
SUGGESTED RETAIL PRICE	$319	$440
FOOTPRINT WIDTH×DEPTH IN MILLIMETERS	420×305	355×323
WARRANTY IN DAYS (PRINTER/PRINTHEAD)	SEE NOTE 1 BELOW	90/1 YEAR
PRINTHEAD	IMPACT DOT MATRIX	9×9 DOT MATRIX
PRINTING	UNIDIRECTIONAL	BIDIRECTIONAL
RIBBON	AXIOM CASSETTE	OKIDATA SPOOL
PROPORTIONAL SPACING	YES	YES
VARIABLE PITCH	YES	YES
SUPERSCRIPT AND SUBSCRIPT	YES	YES
ALTERNATE FONTS	YES	YES
GRAPHICS CAPABILITY	120×120	72×72
PAPER WIDTH IN INCHES	4.5–10	8.5–9
SPEED, MANUFACTURERS LIST, CHARACTERS PER SECOND	12–86; 50 AVERAGE	40–160 CPS (CORRESPONDENCE QUALITY IS 40)
SPEED, ANTIC BENCH TEST, CHARACTERS PER SECOND	35	N/A
FEED TYPE	FRICTION/TRACTOR	FRICTION/TRACTOR
DIP SWITCHES	4	N/A
CONNECTION	DIRECT ATARI CONNECT	PARALLEL STANDARD, SERIAL OPTIONAL
NOISE	LOUD	HIGH PITCHED BUT FAIRLY QUIET
MEAN TIME BETWEEN FAILURES	2,000 HOURS	4,000 HOURS
HEAD LIFE	N/A	N/A
RIBBON LIFE	500 FULL PAGES	N/A
DOCUMENTATION	ADEQUATE	ADEQUATE
COMMENTS	INTERMIXING ALLOWED	BUFFER 256 CHARACTERS OPTIONS INCLUDE ADJUSTABLE TRACTOR

*See end of article for manufacturer information.

DOT MATRIX			LETTER QUALITY		
THINKJET	**GEMINI 10X**	**EPSON FX-80**	**ATARI 1027**	**BROTHER HR-25**	**C.ITOH F10 STARWRITER**
HEWLETT PACKARD	STAR MICRONICS	EPSON AMERICA	ATARI CORPORATION	BROTHER INTERNATIONAL	C.ITOH
$495	$549	$569	$300	$699	$1795
194×282	392×315	420×347	369×156	538×385	574×405
90	180/90	1 YEAR	90	90	1 YEAR
INKJET CARTRIDGE	9-WIRE, 5×9 DOT MATRIX	11×9 DOT MATRIX	FIVE-WHEEL HEAD	DAISYWHEEL	QUME DAISYWHEEL
BIDIRECTIONAL	BIDIRECTIONAL	BIDIRECTIONAL	UNIDIRECTIONAL	BIDIRECTIONAL	BIDIRECTIONAL
INKJET CARTRIDGE	UNDERWOOD SPOOL 13×50MM	CARTRIDGE	CASSETTE	TWO-COLOR BROTHER NYLON OR CARBON FILM	DIABLO RIBBON
YES	YES	YES	NO	YES	YES
YES	YES	YES	NO	YES	YES
YES	YES	YES	NO	YES	YES
YES	YES	YES	NO	BY SWITCHING DAISYWHEEL	SWITCH DAISYWHEEL
192×96	240×144	480×792	NO	NONE	NO
8.5	8–10	9.5–10	8.5	UP TO 15	16.25
120	120	160 CPS	20	24	40
100	80	92	7.5	19	N/A
FRICTION/TRACTOR	FRICTION/TRACTOR	FRICTION/TRACTOR	FRICTION	FRICTION	FRICTION
8	12	12	NONE	16	NO
PARALLEL OR SERIAL	PARALLEL STANDARD, SERIAL OPTIONAL	PARALLEL	DIRECT ATARI CONNECT	PARALLEL STANDARD, SERIAL OPTIONAL	PARALLEL OR SERIAL
VERY QUIET	FAIRLY QUIET	QUIET	LOUD	QUIET	QUIET
5,000 HOURS	5 MILLION LINES	5 MILLION LINES	N/A	3,000 HOURS	3,000 HOURS
100 MILLION CHARACTERS	100 MILLION CHARACTERS	100 MILLION CHARACTERS	N/A	10 MILLION CHARACTERS	N/A
500 FULL PAGES	N/A	3 MILLION CHARACTERS	N/A	60,000–500,000 CHAR. DEPENDING ON TYPE	N/A
GOOD	VERY GOOD, POOR INDEX	VERY GOOD	ABYSMAL	ADEQUATE	POOR
REQUIRES SPECIAL PAPER, REGULAR CARTRIDGES COST ABOUT $8.	INTERMIXING ALLOWED BUFFER 816 BYTES, EXPANDABLE TO 4K OR 8K	ADJUSTABLE TRACTOR $40		BUFFER 3K OPTIONS INCLUDE ADJUSTABLE TRACTOR AND AUTO COPY FUNCTION	OPTIONS INCLUDE ADJUSTABLE TRACTOR

NOTES

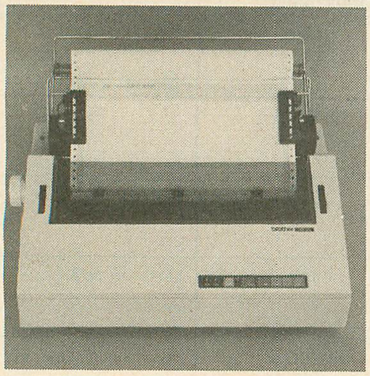
Footnote 1: Warranty 1 year for nonbusiness user, 90 days for business.



Atari 1027

```
XXXXXXXXXXXXXXXXXXXXXXXXX
ABCDEFGHIJKLMNOPQRSTUVWX
XXXXXXXXXXXXXXXXXXXXXXXXX
         Printers vary
     Manufacturers often
       without include lir
XXXXXXXXXXXXXXXXXXXXXXXXX
ABCDEFGHIJKLMNOPQRSTUVWX
XXXXXXXXXXXXXXXXXXXXXXXXX
```

Print sample from Atari



Brother HR-25

```
XXXXXXXXXXXXXXXXXXX
ABCDEFGHIJKLMNOPQRST
XXXXXXXXXXXXXXXXXXX
          Printers v
    Manufacturers of
      without include
XXXXXXXXXXXXXXXXXXX
ABCDEFGHIJKLMNOPQRST
XXXXXXXXXXXXXXXXXXX
```

Print sample from HR-25

perfect if you print variable size labels. It also comes with a roll-feed device, in case you want to use rolled European paper.

The Gemini is fully controllable from software. This includes both internal and external DIP switches, and also the out-of-paper sensor.

Although it is priced at $549, mail order houses (see **Antic** advertisers) frequently sell the Gemini for under $259.

EPSON FX-80

The **Epson FX-80** ($569) is a solid value and the choice of many Atari owners who want high quality dot-matrix printing. The FX-80 offers regular and italic fonts, regular or boldface printing, expanded and compressed print, and excellent graphics ability.

You can download custom fonts to the FX-80, and produce dot-matrix resolutions as high as 240 x 240 dots per square inch. The printer is fast. It also features an out-of-paper sensor that halts operation so you can replace the paper.

The clear competitor for the Epson is the previously discussed Gemini. What do you get for a $20 difference in suggested retail price? Primarily speed. The **Antic** bench test of the two printers indicated the Epson printed at 92 characters per second, including line feeds, to the Gemini's 72. The manufacturers claim 160 cps for the Epson to the Gemini's 120.

Finally, the Epson comes with the best documentation on the market. You will find technical data, a good index, well-described basics and challenges for advanced graphics programmers.

You can find the Epson for about $400 by checking mail order prices.

Incidentally, there are less expensive Epsons which we were not able to review here, but which carry the same reputation for quality as the FX-80. However, only the FX-80 has user-addressable RAM for character set dumps.

LETTER QUALITY PRINTERS

ATARI 1027

The **Atari 1027** ($300) is to letter-quality daisywheel printers what an early Royal Standard is to an IBM Selectric. The eccentric 1027 design uses five wheels on a spindle, each wheel containing characters. These spin over the paper, stopping to press against the ribbon and paper after receiving the proper codes.

The great advantage here is the cost—somewhere under $300, depending on the whim of your local retailer. (Atari officials, who asked not to be quoted by name, reluctantly said that their suggested retail price was $296.84.) The 1027 really is letter-quality and it really works. It also plugs directly into the Atari computer.

However, it takes nearly nine minutes to print a page of text—what a dot-matrix does in one minute. And it only accepts one piece of paper at a time. The construction of the 1027 does not seem convincingly firm, compared to more expensive printers. And it comes with the worst printer documentation we've ever seen.

BROTHER HR-25

The wide-ranging Brother family includes excellent letter-quality printers. We have included the **Brother HR-25** ($699) as a reasonably-priced printer suitable for professional word processing. (You might also wish to consider its little brother, the HR-15. At $419, the HR-15 is slower and has less frills, but still offers excellent quality.)

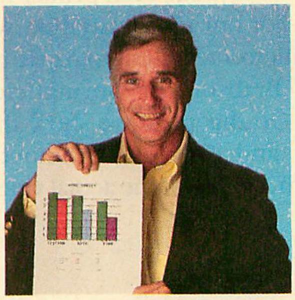
The HR-25 can print in red and black with the proper ribbon. It is solidly built and has all the features required for a good letter-quality machine: proportional spacing, superscript and subscript, strikeout, underlining, paper-out detection, and so on.

The HR-25 also comes with a 3K buffer. This is not necessarily an advantage, as there is no way to turn off the buffer. For certain documents and printing jobs, it's handy to control the

continued on page 33

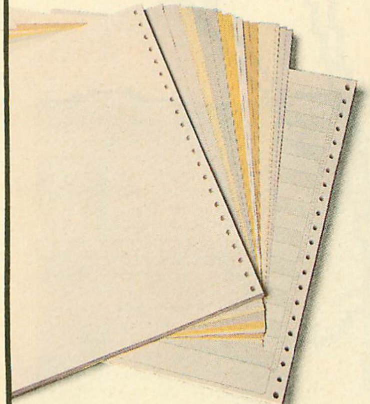
COLOR

The OKIMATE 10 Personal Color Printer's got it for $238.*



The first affordable color printer.

Atari® computer owners, meet the one and only. The new OKIMATE 10 Personal Color Printer. The first personal printer that lets you print in a rainbow of 36 dazzling colors.



Now your Atari personal computer has new meaning. Because OKIMATE 10 can bring the information on your screen to life. Printing on plain paper. In brilliant color. For very little green.

Fully equipped for reading, writing and 'rithmetic.

The OKIMATE 10's word processing capability delivers crisp, clean term papers, school reports and homework. At 240 words per minute. So now you can print an assignment off your Atari personal computer in minutes, instead of typing it in hours. And OKIMATE 10 lets you highlight words, headlines, paragraphs and charts with wide, bold, or fine print. So you and your information really stand out.



If you use your Atari personal computer to keep track of mortgage payments, tuition payments, your checkbook or beat Dow Jones to the punch, here's good news: the OKIMATE 10 gets down to business quickly. And easily.

Easy to learn, easy to use.

"Learn-to-Print" software comes with OKIMATE 10 to show you how to start printing. And the OKIMATE 10 Handbook will teach you how to get your wildest ideas and images down on paper. Now you're set.

OKIMATE 10 makes it easy to get color from the screen to paper because it comes with its own "Color Screen Print" program.

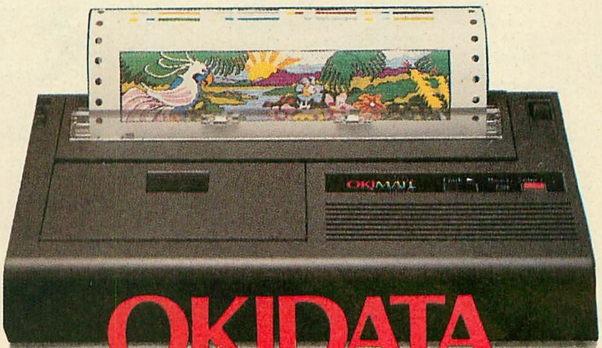
Just plug the OKIMATE 10 into your Atari personal computer with the PLUG 'N PRINT package.* And print. It's that easy.

Everything Included.

For $238 you get both the printer and the PLUG 'N PRINT package plus



everything you need to print: black ribbon, color ribbon, data cable, PLUG 'N PRINT control cartridge, "Learn-to-Print" program, "Color Screen Print" software package, computer paper, and an easy to read handbook.



OKIDATA
an OKI AMERICA company
Mt. Laurel, NJ 08054

Available at retailers everywhere.

Atari is a registered trademark of Atari Inc.
*PLUG 'N PRINT packages for Atari computers sold separately.
Atari requires disk drive and 48K memory.

NEW COLOR PRINTERS

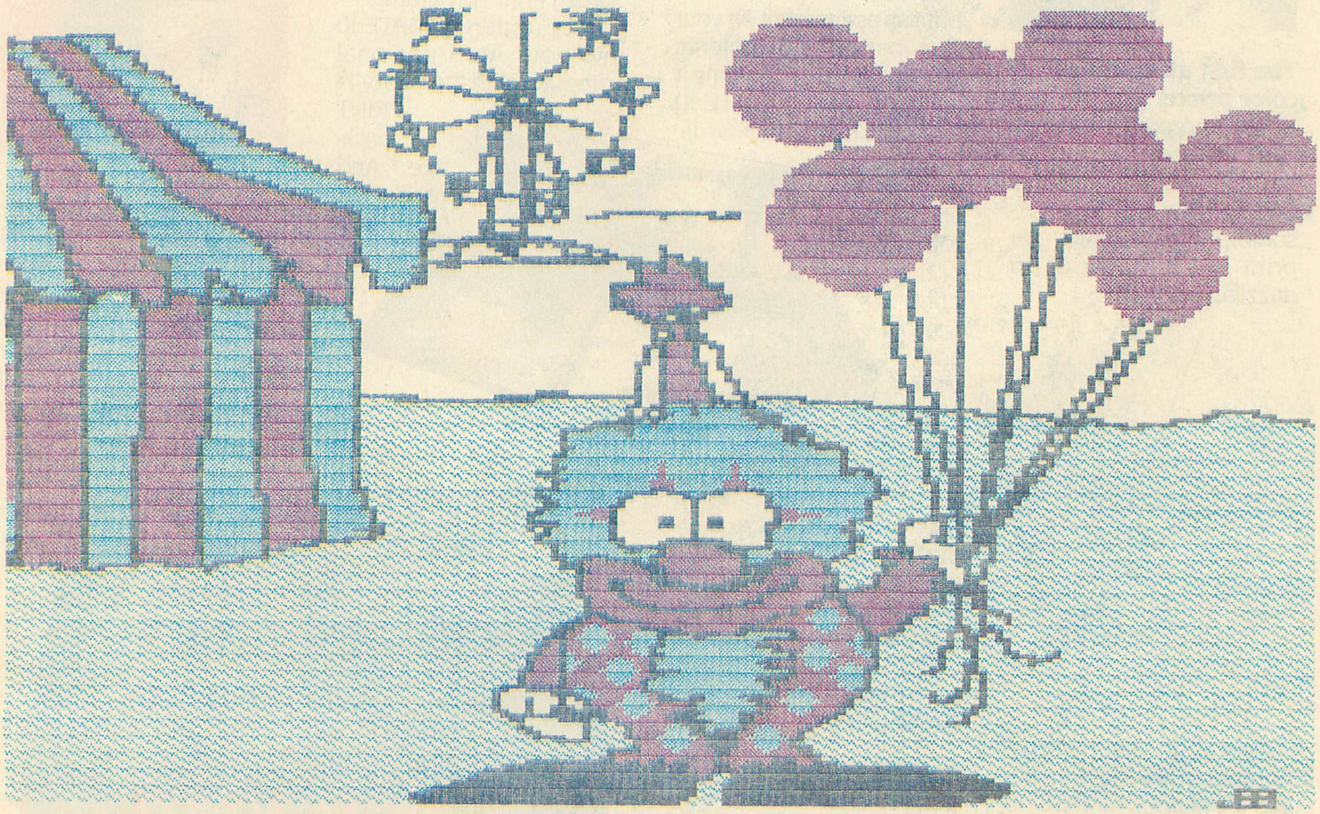
Starting at $238

by CHARLES JACKSON, **Antic** Staff Writer

If you're an Atari microscreen artist who feels you absolutely cannot wait a moment longer to make color printouts affordably, then the **Okimate 10 Personal Color Printer** (Okidata, $238) or the **Seikosha GP-700A Color Graphic Printer** (Axiom, $599) might be just what you're looking for.

However. . .as you can see from the accompanying illustrations, neither printer delivers color pictures that look as bright and sharp as your video display. And we had to spend much of a workday tinkering with the color registers of our sample file before getting any acceptable results. Also, lettering with black ink was not as good as the Gemini and Epson dot matrix printers we're used to.

But you can judge each printer for yourself. For our test illustration we chose a microscreen sent to **Antic** by Jennifer Brabson of Springfield, Virginia. On this page we show the Okimate and Seikosha printouts, along with a photo of the actual video



Seikosha Color Printout

Seikosha Text

The quality of dot-matrix printers varies. Low quality letters will typically look like a pattern of dots with lots of space between each dot. This is that "funny computer type" people talk about, and is typical of early dot-matrix.

image and black-ink text printouts.

OKIMATE

The Okimate 10 comes with a BASIC program that will make color printouts from most Micro Illustrator and Super Sketch picture files. The program can only be used with an 800 XL computer, or a 600 XL computer with a memory expansion board. You'll also need a copy of DOS 2.0S.

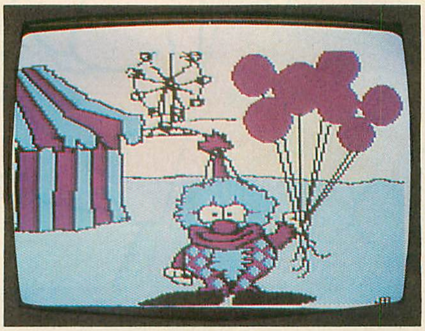
The Okimate is a small, quiet thermal printer that prints 8″×5 ¼″ color images on either single sheet or tractor feed paper. Once we loaded the program, it took 35 minutes to reproduce our sample Micro Illustrator screen. You must choose colors carefully, if you want your final print to resemble the original screen display. The program can accurately represent only 15 of the Atari's 128 available colors.

Okidata technicians said a 128-color version of the printer program would be available later this year.

The printer's "once through" color ribbon cartridge ($6.69) contains enough ink for about five microscreen prints.

SEIKOSHA

The Seikosha is considerably larger, noisier and more expensive than the Okimate—but it runs five times faster. The Seikosha took only seven minutes to print our sample 8″×5 1/4″ color image, and two minutes to generate a 4″ by 2-5/8″ image.



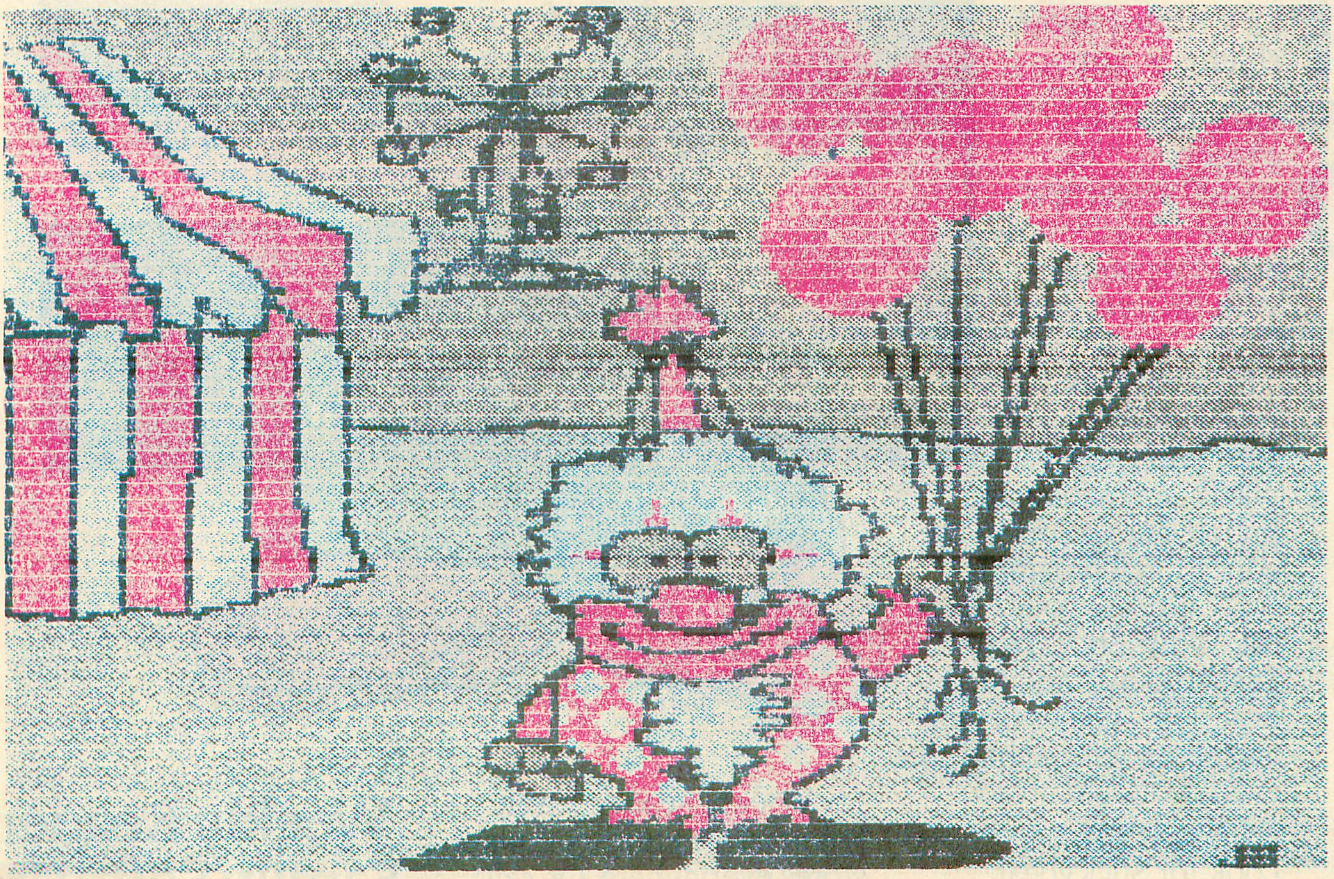
Microscreen Photo

The Seikosha accepts MicroPainter, Graphics Master, Graphics Magician and any other 62-sector Graphics 7.5 or Graphics 8 picture file, and can be used with any Atari computer having at least 48K of memory.

The Seikosha's rewindable ribbon cassette holds four small inking cartridges. When a color is used up, only its cartridge need be replaced. Manufacturers claim each ribbon cassette can print the equivalent of 500 full-page letters.

OKIMATE 10
Okidata Corp.
532 Fellowship Rd.
Mt. Laurel, NJ 08054
(609) 235-2600

SEIKOSHA GP-700A
Axiom Corp.
1014 Griswold Ave.
San Fernando, CA 91340
(800) 232-9466
(213) 365-9521



Okimate Color Printout

Okimate Text

The quality of dot-matrix printers varies. Low quality letters will typically look like a pattern of dots with lots of space between each dot. This is that "funny computer type" people talk about, and is typical of early dot-matrix.

The Bear facts:

Now, you can get...

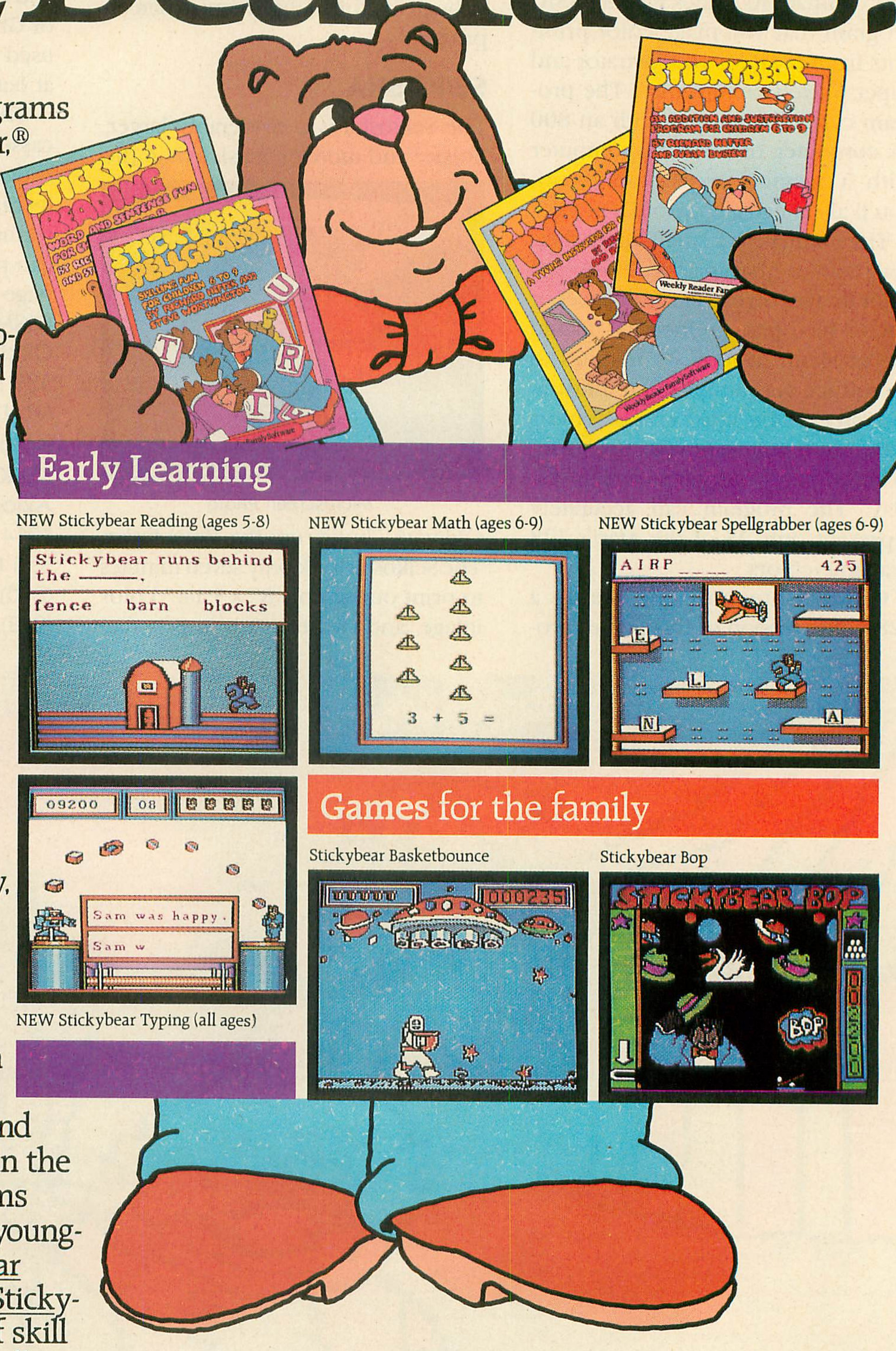
1 NEW software programs featuring Stickybear,® the hottest-selling computer bear in America.

2 Sophisticated color graphics for Commodore 64, Apple® and Atari,® with 48 K.

3 Arcade-quality games for families to play together.

4 New fun learning programs for 5- to 9-year-olds created by a world-famous children's author.

5 Disk, plus hard-cover book* or game,* poster and stickers* in a sturdy, attractive binder – with each program.



There's something new for everyone in your family! The playful animation and bubble-gum colors in the educational programs will captivate your youngest. While Stickybear Basketbounce and Stickybear Bop – games of skill and sharp wits – challenge even dedicated arcade games-players.

Look for Stickybear software – developed by Optimum Resource, Inc. for Weekly Reader Family Software – in finer computer stores everywhere. Or, call toll-free 1-800-852-5000, Dept. AM-25.

*Apple and Atari only.

Weekly Reader Family Software

A division of Xerox Education Publications
Middletown, CT 06457

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continued from page 28

printing from the computer as you watch the output. But this is impossible with a buffer that's always on.

C. ITOH F10 STARWRITER

The **Starwriter** ($1795) is an impressive workhorse of a printer. Solidly built, it is noted for an overall lack of failures and service problems. Beyond having all the standard features of a top-notch printer, it is supported by a major manufacturer of printer/computer peripherals.

Although the list price is $1795, some stores sell this printer for $1295, and catalogs have listed the Starwriter for $949.

Ribbons and daisywheels for the Starwriter are common items used by many major printers—Qume and Sprint wheels and Diablo ribbons.

The Starwriter's one drawback is that its documentation is just barely adequate. The manual looks like unedited technical notes, with little help for the new user. There's plenty of information, but it's presented very badly.

PRINTER ACCESSORIES

The following is a list of leading printer accessory products designed especially for Atari computers. Here you'll find those essential cables and interfaces, memory buffers that free your computer during a long printout, and software for printing graphics dumps or the Atari special characters.

Microprint: Parallel printer interface, acts as replacement for 850. Plugging directly into serial bus, it works with full line of Atari computers and is compatible with NEC, Epson, Prowriter, etc. $69.95.

MPP-1150: Basically an upgrade of the Microprint. Comes with serial and parallel plugs and 2K printer buffer. $89.95.

MicroStuffer: 64K printer buffer $149.95.

Microbits Peripheral Products. 225 Third Ave. SW. Albany, OR 97321. (503) 967–9075.

Parallax-AT Printer Interface: Connects any parallel printer to an Atari. XL Compatible. Works with all parallel printers and software. 2 year warranty. $89.

Axiom Corp. 1014 Griswold Ave. San Fernando, CA 91304. (818) 365–9521.

U-Print: Low-cost printer interface. Works with all popular printers such as Epson, Gemini and NEC. Compatible with all Atari hardware & software. $89.95.

Printer Buffer: User-upgradable memory (16 to 64k) allows you to store up to 32 pages of text, freeing your Atari for more important tasks (like Lode Runner). Compatible with U-Print and all Atari computers. 16k—$119.95, 64k—$179.95.

Digital Devices. 430 10th St. Suite N205. Atlanta, GA 30318. (800) 554–4898 (Outside Georgia). (404) 872–4430 (Inside Georgia).

Printwiz: All-purpose graphics dump and program lister that works with all Atari-compatible printers and interfaces. Lets you list control and inverse characters, and dump screens created in BASIC, LOGO and graphics programs such as Micropainter and Paint. 16K-disk. $29.95.

Allen Macroware. P.O. Box 2205. Redondo Beach, CA 90278. (213) 376–4105.

Lister Plus: This is the software **Antic** uses with a Gemini 10X printer for the program listings you see in the magazine. It dumps any listed file to printers, using any character set you choose. 48K-disk, requires BASIC. $19.95.

Picture Plus: Converts various types of picture files, including Micropainter and Micro Illustrator, into a format that can be used wih your own BASIC program or dumped to a printer in four different sizes. 48K-disk, requires BASIC. $29.95.

Non-Standard Magic. P.O. Box 45. Girard, OH 44420. (216) 539–6033.

Megafont II: Program lister and graphics dump. Allows you to list inverse and control characters, etc., from a BASIC program. Also dumps Gr.7+ and Gr.8 screens. Works with NEC, Prowriter, Epson w/Graftrax, and similar printers. 48K-disk. $24.95.

Xlent Software. P.O. Box 5228, Dept. B. Springfield, VA 22150. (703) 644–8881.

Magniprint: Reproduce your artistic genius in any size, from 1/8 of a page to giant wall-size posters, or enlarge and print any part of a screen. Works with B-Graph, Micropainter, Fun With Art, Koala, etc, compatible with Epson, NEC, C. Itoh Prowriter and Gemini printers. 48K-disk. $20.95.

Alpha Systems. 4435 Maplepark Road. Stow, Ohio 44224. (216) 374–7469.

MANUFACTURER INFORMATION

C. Itoh
19750 South Vermont, Suite 220
Torrance, Ca. 90502
(213) 327-2110

Brother International
20 Goodyear Place
Irvine, Ca. 92714
(714) 859-9700

Atari Corp.
1265 Borregas
Sunnyvale, Ca. 94088
(408) 745-2000

Epson America
2780 Lomita Blvd.
Torrance, Ca. 90505
(213) 539-9140

Star Micronics
888 Washington Street
Dedham, Ma. 02026
(617) 329-8560

Hewlett Packard
Inquiries Manager
1020 NE Circle Blvd.
Corvallis, Or. 97330

Okidata
Mt. Laurel, NJ 08054
(609) 235-2600

Axiom Corporation
1014 Griswold Ave.
San Fernando, Ca. 91340
(818) 365-9521

SECRETS OF ATARIWRITER

(and Atari printers, too!)

by CASSIE STAHL

An authoritative compendium of never-documented techniques for using AtariWriter word processing software, written by a former Atari insider. Plus little-known methods for getting more out of Atari-made printers.

A lot of the early software for Atari Computers contained hidden messages, secret rooms and other surprises that Atari personnel called Easter eggs. These surprises managed to creep into "finished and tested" software although they were never officially approved by Atari management.

The main reason for these little surprises was Atari's reluctance to include programmers' names on the software package. For many programmers, the temptation to identify their work was too great, and they inserted their own secret markings in many different ways.

AtariWriter is especially notorious for including features that were never documented in the manual or made public. The secrets in this article may be only the beginning. Perhaps there are other "Easter eggs" I have missed. Please write **Antic** and let everybody know if you have discovered any other Secrets of AtariWriter.

1. FORM LETTERS

There are actually two different ways to create form letters with AtariWriter. The worse method found its way onto page 39 of the manual, under the heading FORM PRINTING.

With this technique you insert a special code in the document that stops printing. When the printer halts, you keyboard in the new information and it's printed as soon as [RETURN] is pressed.

The problem is that you have to sit and wait for the page to stop printing before inserting the information for the next letter. Here's the undocumented better way:

SECRET MAILMERGE

We will start by creating the shell document file. Type the letter below. The [OPTION][INSERT] key combination marks the location for text to be automatically inserted later.

[OPTION][INSERT]

[OPTION][INSERT]
[OPTION][INSERT]
[OPTION][INSERT]

Dear [OPTION][INSERT]:
Thank you for visiting our store during the holidays. Included in this letter is a coupon for $25 off any Atari equipment purchased before April 1, 1985.

Sincerely,

Mrs. Store Owner
11 Main St
Anytown, City 99999

The first [OPTION][INSERT] is the date. The next three [OPTION][INSERT] lines mark the name and address of the person receiving the letter. The last [OPTION][INSERT] puts in the right name after the salutation. Save this shell document to disk and call it FORM.

The second file to create is the database. After selecting CREATE FILE from the main menu, type in data in the exact order you want it to print.

Type in the date and press [RETURN]. On the second line, type the name Jeff Roberts and again press [RETURN]. Type 101 Main Street on the next line and press [RETURN]. Next type San Francisco, CA 99999 and press [RETURN]. For final line, type in Jeff. This is the first record in our database.

To add more records into the database, simply type in another line of information for each [OPTION][INSERT] in the letter. Don't leave any empty lines between records, the computer will interpret these as blank lines.

After all the names and addresses on your mailing list are entered into the computer, you can press the [ESC] key and select SAVE FILE from the main menu. Call this file DATA.

Once the DATA file is saved to disk, you can select the LOAD FILE option and move your FORM file into memory. Select PRINT from the main menu and answer the prompts carefully.

As the printer encounters an [OPTION][INSERT] in the letter it will pause and ask you to MAKE ENTRY, HIT RETURN. Press the [CONTROL] key and the [V] key at the same time. Then type in D1:DATA and press [RETURN]. The disk drive should begin whirring and the information from the disk will be included in the letter.

2. ELECTRONIC MAIL

If you have an old Atari 830 modem and TeleLink cartridge you can use AtariWriter to upload and download! This method may also work with other modems, as is or with modifications, but the only hardware compatibility I can personally vouch for is the 830 with TeleLink.

In this example, let's say I am going to send you a file and you are going to receive it through your 830. We will both need to do some preliminary setting up. First we turn on our 850 interface modules, disk drives and 830 modems. Set the 830 modem to half duplex. If you have your original Master Disk with the AUTORUN.SYS file on it, you can insert that into your disk drive. If you do not have AUTORUN.SYS, see the suggestions in this issue's I/O Board section.

After you have placed your AtariWriter cartridge in your computer, turn the volume on your monitor up and turn on your computer. The drive will begin whirring and you should hear beeps coming out of the monitor. If the initial title screen is red, it means that DOS is not on the disk that was inserted the drive. If the title screen is blue, it means that DOS is loading properly.

FOLLOW THESE STEPS

As soon as we have each other on the telephone, I will load my transmission file into my computer. I simply select LOAD FILE from the main menu, enter a D:FILENAME after the prompt and hit [RETURN]. You will need to select CREATE FILE from your main menu screen. The CREATE FILE command will take you to the typing area of AtariWriter. To exit, you must press the [ESC] key. You will also have to select LOAD FILE from the main menu.

After the prompt you should type in R1: and then switch your modem to ANSWER mode. Place your phone in the handset and press [RETURN].

Next I will select SAVE from the menu, type in R1: and push [RETURN]. If things are working, I will hear a buzzing noise that tells me your modem is placed in the handset. Do not worry if you don't hear the sound, sometimes it's hard to hear.

Now I'll switch my modem to ORIGINATE mode and place my phone in the handset. When I press [RETURN], I will hear a beeping noise coming out of my monitor, which means data is being transmitted sucessfully.

When your screen prompts you

continued on next page



with SELECT LETTER, type [E] to edit the document. This will show you the document in the typing area. If you just want to save it to disk, press the [ESC] key and select SAVE from the main menu. Type in D1:FILENAME at the prompt.

That's all there is to it. If you find that it doesn't work the first time, try again and go through the steps a little more slowly.

3. ATARI PRINTING SECRETS

825 BOLD PRINTING

Some commands can be used to do more than they were intended for. The superscript command causes the printer to back up half a line and print. If two of these commands are used together, the printer backs up one whole line—the same line it just finished printing. So if you type in the same words before and after the two superscript commands, you can get the letters printed over twice. Instant boldface on your Atari 825 printer!

1025 ELONGATIONS

To print elongated characters with the 1025 printer you need to set [CONTROL][G] to [3]. To turn off the elongated characters type in [CONTROL][G] followed by a [1] for 10 characters per inch (cpi), or a [2] for 16.7 cpi. The usual [SELECT][E] command will not create elongated printing on the 1025.

TIPS FOR THE 1025 AND 1027

To print with single sheets of letter paper on your Atari 1025 or 1027, insert the [CONTROL][W] page wait command at the beginning of the document under the print formatting line. The printer will pause at the end of each page, and you can insert a new sheet of paper. Press [RETURN] when you're ready to start the next page. NOTE: For the 1025, first tape down the Paper Out switch on on top of the printer towards the upper left.

International characters can be accessed on the 1025 and 1027 by inserting a [CONTROL][O] (capital letter) [27] followed by [CONTROL][O][23]. This activates the international character mode. As each character is needed, you have to use the [CONTROL][O] and the decimal code for that letter. These codes are listed in your printer manual.

1027 MYSTERIES

The 1027 has an unusual quirk. It sometimes stops printing for no apparent reason. Try not to worry when your printer falls asleep on you. Just leave it alone and it will recover in about 4 1/2 minutes. When it awakes, it will begin printing right where it left off.

Also, the 1027 does not underline when inverse video is used. Select printer number one from the main menu and insert [CONTROL][O] (capital letter) [15] where you want the underline to begin and a [CONTROL][O] [14] where you want the underline to end.

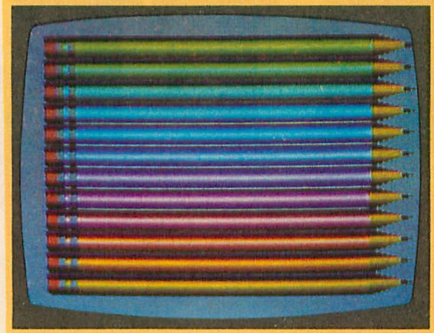
If your margins have been brought in closer than the default values, the underline starts from the far left of the paper. The easiest solution is to adjust the margins. If this is not possible, you can turn off the underlining after the last word on the line, and turn it back on for the first word on the following line.

Never use labels in your Atari 1027 printer. They can easily peel off their backing and stick to the delicate inner workings of the printer. When the 1027 gets repaired, the entire print head mechanism is removed and replaced. It can be costly. Instead, you can use your 1027 to make a label template on plain paper, but reproduce the finished labels on a photocopier, using special peel-off sheets that work with most copying machines.

When Atari had its own bulletin board for users groups, Cassie Stahl ran it. She is now the documentation writer for a major Macintosh software publisher.

microscreens

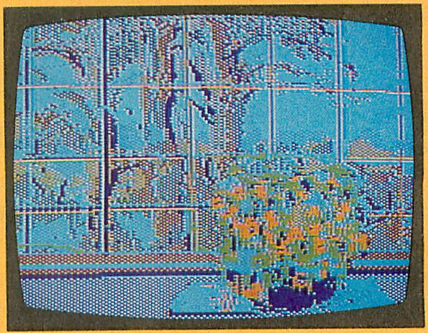
If we publish your Atari computer art on our Microscreens page you get an Antic T-shirt. Send your pictures to **Antic** on disk or cassette. Include loading instructions on a short note telling us about yourself and which graphics tools you use . . . also enclose your two choices of T-shirt size and color. And if you want your material back, be sure to send a stamped self-addressed return envelope.



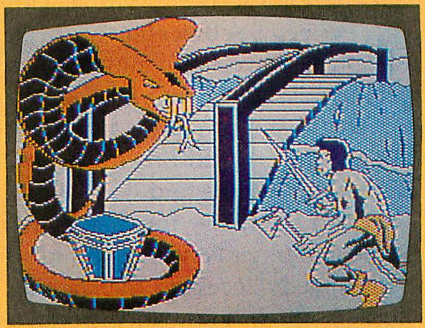
Pencils is in Graphics 3 mode, uses 4 players, GTIA, display list interrupts and takes 30 seconds to draw itself on the screen. Microartist Gregg Tavares has done a professional arcade conversion for AtariSoft and lives in Provo, Utah. Antic Disk subscribers get the file as a bonus.



Pauline Murabayashi obviously drew **Winter** from her imagination, since she is from Hawaii. **Antic** published another of her pictures in February 1984. She uses Datasoft's Graphic Master.



Window is a KoalaPad image from Robert Robinson, an art and computer graphics teacher at a Long Island high school. This scene is from his home in Setauket.



Edwin Reveche of Baldwin Park in Southern California used his own BASIC drawing program and overlays to make this fantasy adventure scene, **Lilworm.**

LETTER PERFECT IMPROVED

Version 6 has more perfection

by GEORGE JACOBS

Atari owners will be glad to learn that LJK, Inc. has done it again! In their Version 6 they've added new features to an already successful word processing program and made it even more versatile. They've also come up with an improved manual. A newcomer to word processing can figure out how to work the program without outside assistance. The manual requires some close study but the benefits are worth it.

Those familiar with earlier versions of **Letter Perfect** will know there was very little it couldn't do in text writing with ease and accuracy. Headers (repeating page titles), automatic page numbering, change of type styles at will, various simple methods to correct mistakes and add or subtract text — all the standard features of any decent word processing — have always been available with Letter Perfect. **Spell Perfect** has been available since version 1 and it makes spelling mistakes a cinch to find and correct. The improvements are largely enhancements of existing features to allow faster editing and correcting.

If I had to choose the niftiest adjustment to Letter Perfect, it would be in the speedy access to the spelling checker, which is now incorporated in the master disk. As soon as text has been written, the writer can have it examined by the computer even before writing the file to disk. This saves several steps common to most spell checking procedures. When you have enough material to keep, you go directly from "editing" to "dictionary" and the words are counted in seconds. At that point, the computer begins a search in a dictionary disk and helps you make corrections where necessary.

EASY CURSOR

The next important improvement is in the speed with which the cursor can move through a text. Now Letter Perfect will allow you to move a word at a time in either direction, instead of only one space at a time as before. You can jump forward by paragraphs too, and also to a marker which you can place anywhere in the text. You can have any number of markers too. You could always move one video screen page at a time, but even this action is smoother and easier on the eyes than it used to be. You can delete a word at a time in either direction, or any of a paragraph following the cursor. The deletion up to the marker feature is also a big help in editing large chunks or shortening files.

Letter Perfect menus are now faster to order from. To tell the computer to load or save, move the <pointers> or type the first letter of any choice. Not only do the <pointers> go directly to the new choice but the order is fulfilled without hitting the return key and the name of the file in editor is displayed.

Another new attraction is a command which will prevent the separation of a paragraph into portions of two pages. This is particularly attractive to those of us who want to incorporate small drawings or pictures into text. After juggling margins and line widths to design a nice spot for an insert, it's disconcerting to see it made useless by crude cropping.

EASY DENSITY

Letter Perfect has made it much easier to go back and forth between single and double density. Double density will expand the storage capacity of your floppies. Using double density is like writing a long letter on a *post* card by condensing your penmanship. The information will still be the same and the print size will also be its usual dimensions. Single density Letter Perfect files, therefore, can be made to take up half the space by con-

continued on page 41

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And, included as standard equipment, each comes with the exclusive GT DrivingSystem™ of software programs. World-class word processing is a breeze with the GT Estate WordProcessor.™ And your dealer will describe the two additional programs that allow GT owners to accelerate their computer driving skills.

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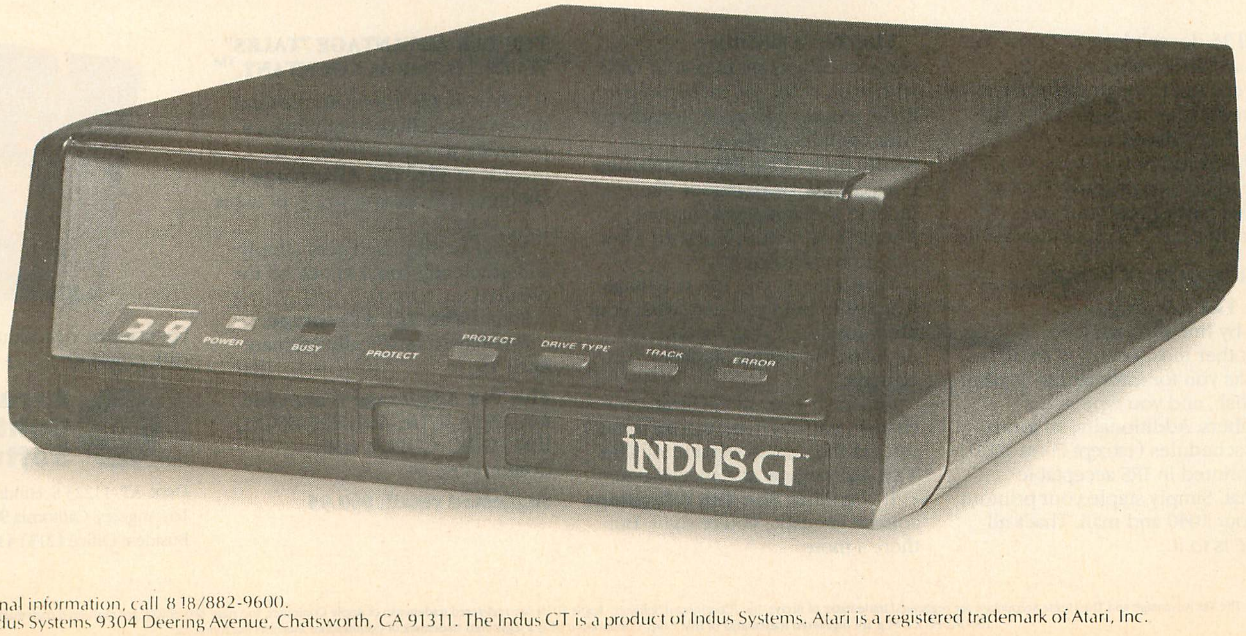
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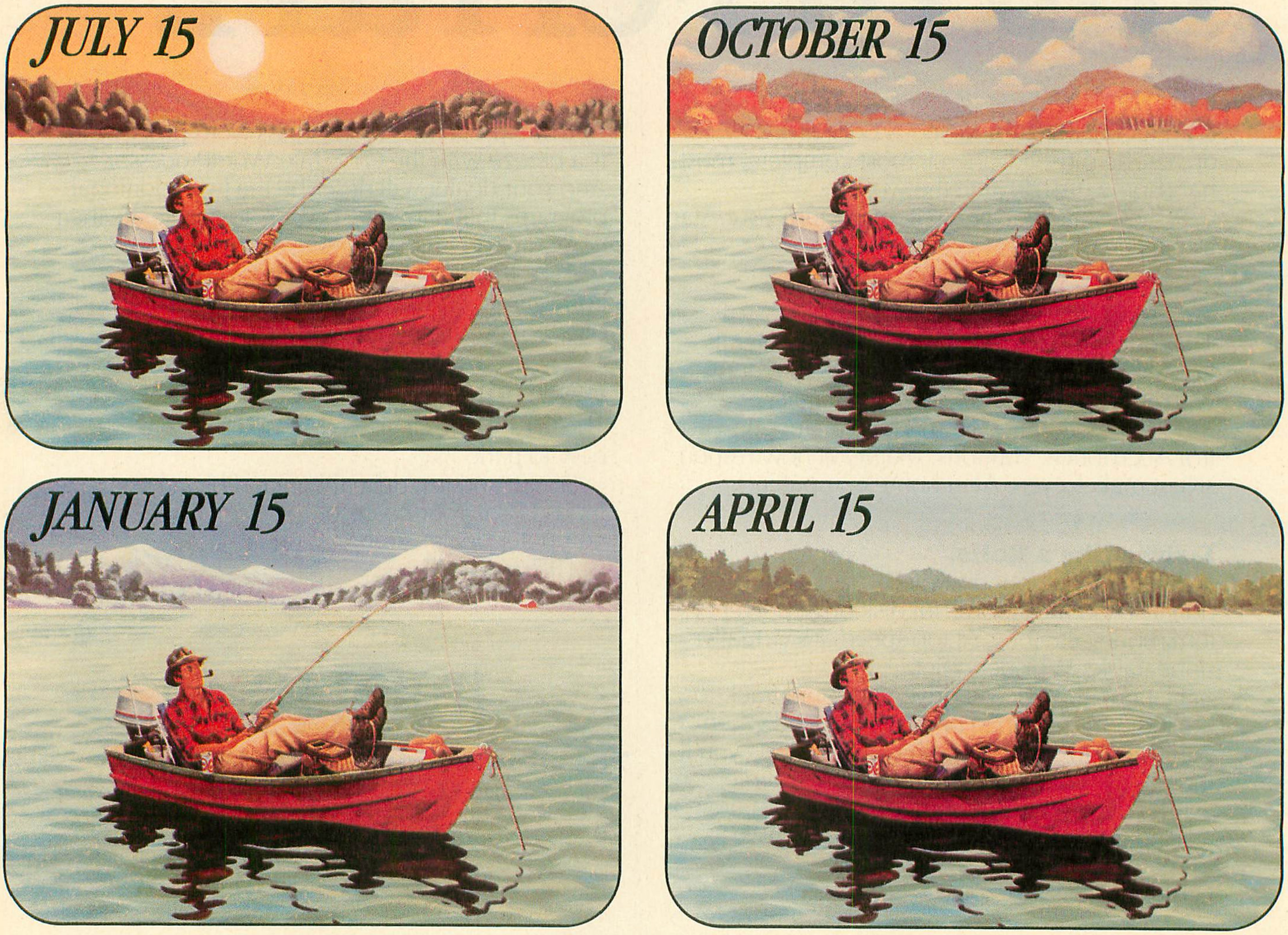
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The Tax Advantage takes you line-by-line through Form 1040 and the other most common tax forms. It asks you for information in plain English, and you type in the numbers. Additionally, all forms and schedules (except Form 1040) are printed in IRS acceptable format. Simply staple your printout to your 1040 and mail. That's all there is to it.

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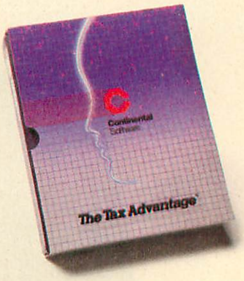
You'll be surprised how simply and efficiently you'll knock off the dreaded tax return.

So get **The Tax Advantage.**

And have a terrifically ordinary April 15.

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LETTER PERFECT IMPROVED
continued from page 38

verting them to double density on another disk.

The TAB key no longer deletes text as it shoots across your screen. This is a big help in zeroing in on number tables and also cuts down on accidental word deletions. The simple search command now pauses at the expression you are looking for and allows you to correct it without having to use a search and replace command.

PRINTER SET-UP

I've saved the clincher for last. Letter Perfect costs just under $100! Atari computers are great value for money these days and with a disk drive, interface and printer, you can set up a true word processing facility for under $1000 — compatible with Spell Perfect and **Data Perfect** too.

What's more, you can use just about any printer on the market. Although it formerly came with a separate "printer editor" floppy, the Letter Perfect master disk now includes built-in options for nine popular printers. If you choose a non-listed machine, the disk provides an easy system for setting up your own specifications to make your printer function properly. Letter Perfect will drive dot matrix or letter quality printers including those with proportional spacing.

When you boot up your Version 6, you can enter your specifications for the types of writing you do the most often. For example, you can program a letter writing set of commands. Set "j0" for no justification, "l2" for single line spacing (that's a small "L", not a "one"), width of page that you prefer, etc. . . . Then you can save this to one of the six different printer programs listed. Make another program for texts *with* justification, double spacing and so forth. Instead of recalculating every different job, you simply boot in the printer program of your choice and go to it.

LETTER PERFECT VERSION 6
LJK, Inc.
7852 Big Bend Blvd.
St. Louis, MO 63119
(314) 962-1855
$99.95, 32K — disk

George Jacobs is a professional author, artist and photographer living in Woods Hole, MA. He has owned and extensively used an Atari for two years.

CUSTOM PRINT
continued from page 21

The next prompt is for the drive number that the text file is on. If you chose not to use a custom c-set, this will be the next input after bypassing the c-set loader routine. Press the key for the desired disk drive number 1–4. Again a directory of that disk is displayed on the screen. You will then be requested to input the text filename again. All the same options are available.

FORMAT SELECTION

The file must be either a LISTed program file or a text file with a carriage return (character 155) imbedded every 255 characters. Typically you will print LISTed BASIC programs. I frequently use Custom Print with a simple BASIC text editor to create exotic title pages for my articles, or print fancy letters to friends.

After a valid filename is given, you will be asked for the number of print characters per line. NEC users have no options here. The NEC has only one graphics dot density, which works out to the 60 characters per line print mode. Gemini users have the option to print with 60, 120, or even a tight-packed 240 characters per print line. This latter print density is just a bit tough on the eyes. But since the Gemini supports a quad density dot graphics mode, I decided to implement it in the program. Epson owners have only the first two options. Modify listing 1 as follows:

```
260 ? "[1] 60 [2] 120 ";:G
ET #2,A:? CHR$(27);CHR$(A)
270 A=A-48:IF A<1 OR A>2 T
HEN ? "VALUE ERROR!":GOTO
 260
```

The 60 characters per line makes the most readable listings. They are slightly oversized characters in comparison to the normal printer characters. The 120 characters per line is quite readable too. It is best for BASIC program listings, since BASIC allows a maximum of 120 characters per line. Each program line will appear on one print line in the listing without wrap-around. Gemini owners may get a kick out of the 240 characters per line print mode, but it is very difficult to read.

Custom Print then prompts you for vertical line spacing. Option one is "stacked" print. This means that each line is printed just above the next, exactly as characters appear on the Atari screen. This is ideal for printing out control-character graphics text files. Some of my sysop friends (Bulletin Board System Operators) use the 120 character per line, stacked print mode for program listings. Modifying their BBS programs as frequently as they do can eat up a lot of paper, but this print format is quite paper-efficient. Option two selects single spaced print, which is most commonly used for program listings.

CENTER OR JUSTIFY

Next you are prompted for text positioning. The first option selects centering of text. I commonly use this option when making title pages. Block left, the second option, is the most commonly used print style. Block right is a bit unusual. You might consider using this for listings you intend to put in a binder.

The next step is title input. If you do not want a title, just press [RETURN]. Next you will be asked if you wish to skip perforations. If your answer is yes, the listing will be paginated without title or page numbering. Suppressing perforation skipping allows you to print continuous labels from preformatted text files. This is commonly used by sysops who keep extensive user group disk libraries. If a title is input, it will be printed at the top of each page along with page number. I usually use the title for the program name, revision number, and listing date.

Finally you will be asked to double check your printer and disk drive to be sure all is ready. Then press the [RETURN] key to begin printing. Once started, if you change your mind for any reason, just press the [ESCAPE] key to abort the printing. If a custom c-set was chosen, this c-set will be enabled as the file is printed.

After the file is printed, or print aborted, you will be prompted to continue listing files or quit. If you quit, the program will restore the memory

it had previously reserved for custom c-set data. This precludes the need of pressing [SYSTEM RESET] to recover the reserved RAM.

TECHNICAL NOTES

Custom Print uses the printer's dot addressable graphics capabilities to LIST your files. The Machine Language program in PROG$ reads the currently installed c-set bit maps and translates them into a format that your printer can understand. Other printers may be used with this program if the escape-control print codes are modified according to your printer's needs.

Because Atari's characters are an 8x8 dot matrix, this program will not work on graphics printers with only a 5x7 dot matrix. If you make modifications to listing 1 and your printouts have upside-down characters, then replace line 100 of the program with the line 100 for the NEC revision in listing 2. (NOTE: **Antic** urges all readers making modifications for printers not listed above to send those modifications to us so that we can pass them on to our readers —ANTIC ED).

There is a limitation with the Atari printer handler that most people are not aware of. You absolutely cannot send an ATASCII 155 to your printer. The P: device always converts 155s (Atari's internal representation of carriage return) to ASCII 13.

To get around this problem, the machine language string PROG$ looks for these 155s as it converts the bit maps for your printer. If it finds any, they are changed to ATASCII 151s.

This bit map is different, but close enough that the character is still quite readable. Using Atari's c-set, this problem occurs only with the upper case, inverse video letter "A". Compare closely the printout of normal and inverse video "A" in the Atari c-set example to see the difference. This is certainly better than having an unreadable character.

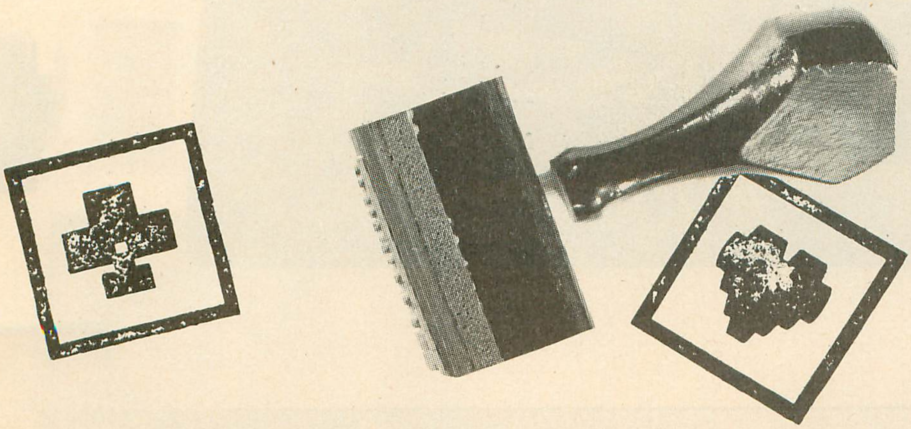
MYSTERY PAUSE

This program is completely compatible with XL machines and does not need the Translator disk, but you may wish to use it because of another undocumented XL Operating System bug. Occasionally, a printout will pause for 35–40 seconds for no apparent reason and will then pick up right where it left off again, without dropping a single character.

At first I thought it was a certain character combination (as Atari personnel explained it to me). After checking into the problem further, I found that the pauses are entirely random. It even happens occasionally when just listing a program with the printer's standard characters. The problem occurs more often with Custom Print, because it sends 8 bytes of data for every printed character. Be patient and your printout will always pick up right where it left off. The Translator will cure this timeout problem if you need that listing in a hurry.

Matthew J.W. Ratcliff is an electrical engineer in St. Louis, Missouri and a regular contributor to ***Antic.***

Listing on page 57



LABEL MAKER
continued from page 19

printer and RUN Listing 1. You will be asked to enter a border character. For now, press [X] and the screen will display an example of what the label will look like with X's as the border. You can then accept that border or choose another character.

If you press [ESC] at this point, you will be asked for a 3 digit number representing one of the graphics characters found on page 227 of the Gemini manual. (Epson owners can ignore the special characters). Type in your number and press [RETURN]. Since your computer has different character codes than the Gemini chart, what you next see on the screen will not be the same character as what is printed.

As you continue with the program, you are given opportunities to back up and re-do any of the steps. Eventually, you enter the name and address as it should appear on your labels. Reference numbers appear overhead to help in centering each line. At the end of each line, press [RETURN] to continue.

When finished with the entire address, you can change your border character or press [RETURN] to continue. Then you have the option of choosing any of the line numbers to re-edit, or choosing 0 if all is okay.

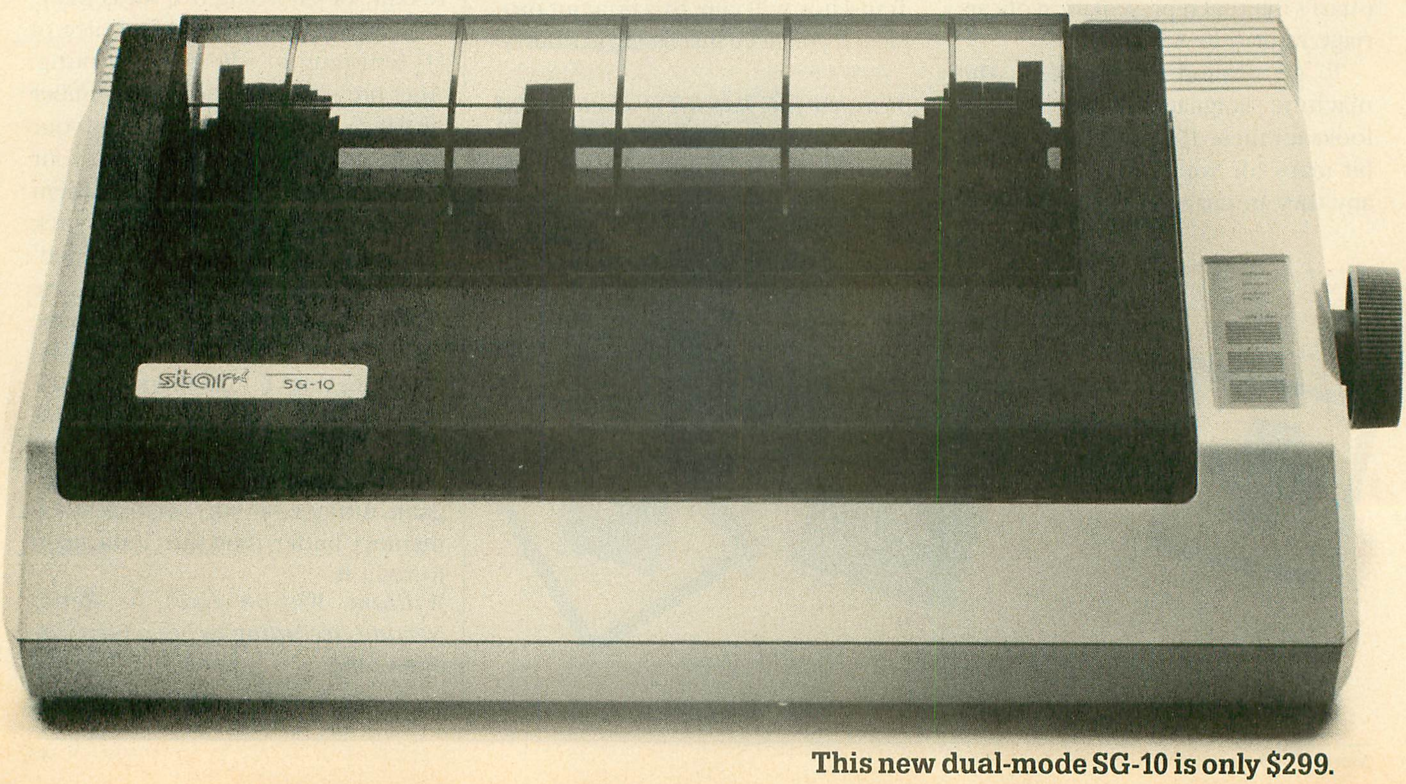
Next, you are given the choice of [1] returning to edit or [2] printing. After pressing [2], type in the number of labels you want, line up your printer and away you go! When your labels are all printed, simply cut them into four parts with scissors and stick them on your envelopes as needed.

If you want to print larger—one return address on each label—merge Listing 2 with listing 1 as follows: LOAD Listing 1 into memory then enter Listing 2 by typing ENTER "D:Filename" (Cassette, ENTER "C:"). Before running the altered program, turn your printer off to clear the memory buffer, then turn it on again to reset it.

William Watson lives in Reno, Nevada according to his return address label.

Listing on page 60

STAR'S NEW PRINTERS WORK 20% FASTER. COST 20% LESS. ARE 100% CERTAIN TO CHANGE YOUR MIND ABOUT PRINTERS.



This new dual-mode SG-10 is only $299.

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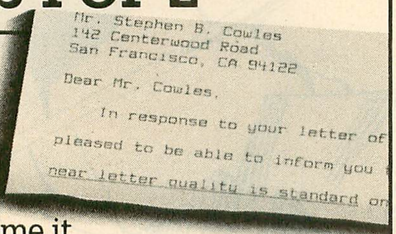
The new "S" series printers from Star Micronics have been designed not to our specifications, but to yours. With values that confound our accountants but will make great sense to you.

These printers are faster than ever. More compatible and reliable. With more added in and fewer add-ons.

And yet they cost *less*.

Don't try to figure it out. Just enjoy.

NLQ IS 1 OF 2


Mr. Stephen B. Cowles
142 Centerwood Road
San Francisco, CA 94122

Dear Mr. Cowles,

In response to your letter of
pleased to be able to inform you
near letter quality is standard on

Because we've increased our printing throughput by 20%, you can now finish 6 pages in the time it used to take to print 5. And even though we've upped our speed, we've kept up our quality.

In fact, on three of our new models, both draft *and near-letter-quality* are standard (no extra charge). A fourth model, the SB-10, prints draft *and letter-quality* standard (again, not extra).

So now, with just *one* printer, you're ready for data processing and word processing. That's like owning two printers for the price of just one.

GET ON LINE BY JUST PLUGGING IN

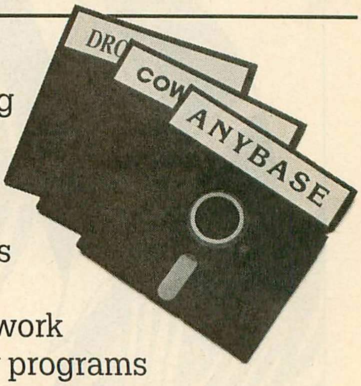


The new Star "S" series printers are fully compatible with even the most fickle of personal computers.

And they're especially friendly with IBM®-PC, Apple,® Commodore,® and all compatibles.

In most cases, hooking up is no more complicated than putting a square peg in a square hole. But it's a lot more rewarding.

READY FOR ANY SOFTWARE



The new "S" series printers make printing as easy as 1-2-3.™ Which is just one example of the many spreadsheet programs they're ready for.

The new Stars can work with word processing programs like WordStar.® Educational software like Dr. Logo.™ And even the new integrated formats like Framework™ and Symphony.™

So Star printers match hardware to software without disk-driving you crazy.

They handle many functions faster. They're more compatible. Less expensive. More reliable. And have a full year warranty. "S" series printers have been designed with so many of your needs in mind, it's as if you'd done it yourself.

And what a great job you did.

For a free demonstration, visit your local Star dealer.



SD-10 types draft and NLQ, just $449.

SR-10 prints 200 cps for only $649.

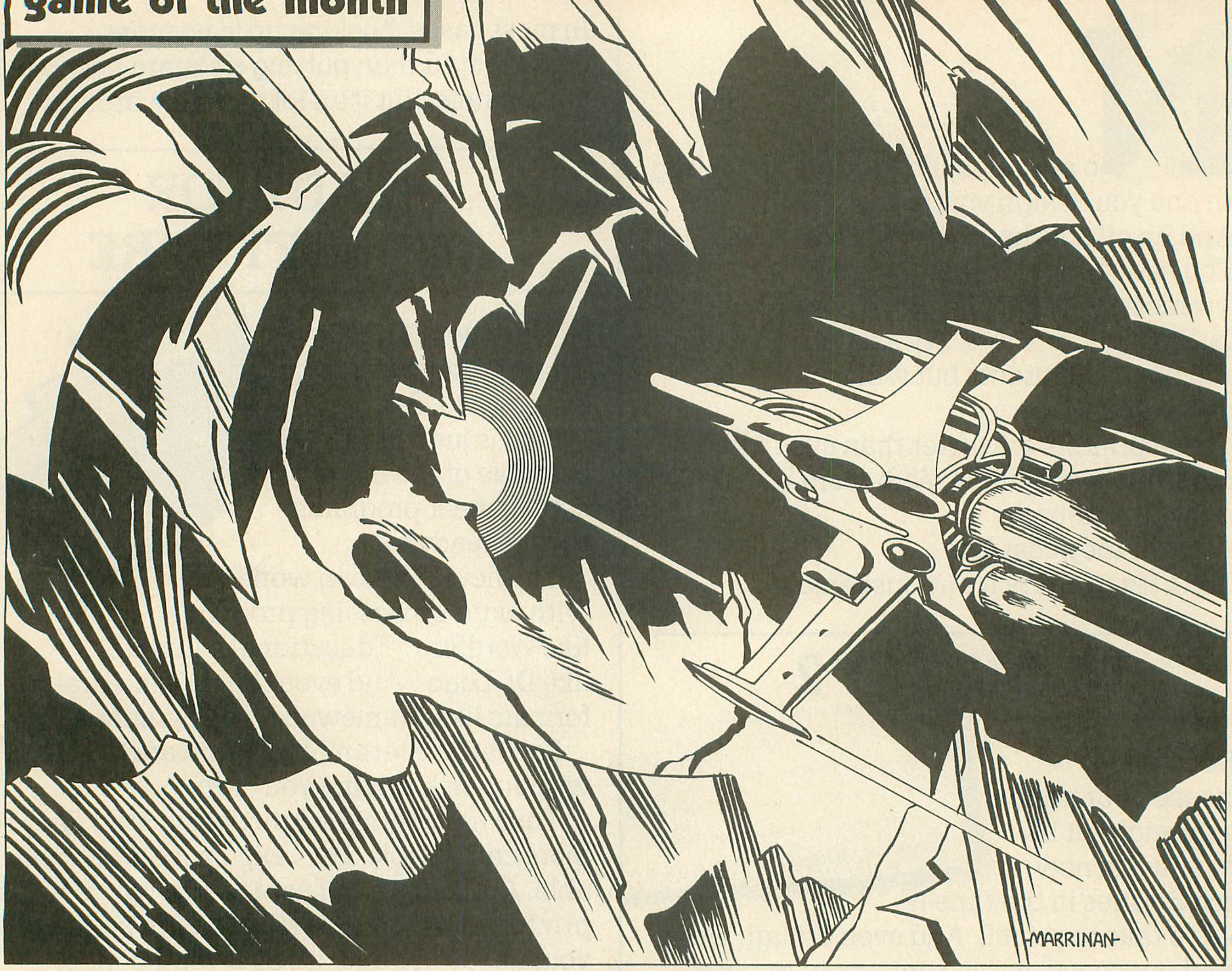
SR-15 includes 16K memory for spreadsheets, $799.

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THIEF

by MAX LANGERT

A scrolling graphics maze adventure. Pilot a spaceship through dangerous caverns to recover stolen treasure. The BASIC program runs on all Atari computers.

You are a daring space pilot who has flown your explorer craft into the deadly caves where stolen treasures from your planet were hidden many centuries ago.

Type in the listing, check it with TYPO II, and SAVE it to disk or cassette before you RUN it.

EXPLORING THE CAVES

Your fuel tank can only hold 1,000 energy units. Therefore, along with recovering treasures, you also want to pick up energy cubes for a 500-unit recharge. Picking things up is accomplished simply by touching them. You must pick up a treasure before you can get to the next screen.

Just for a change, there's nothing chasing you or shooting at you down here. However. . . if you bump into one of the large, jagged rocks or run out of energy your ship will explode.

And if you brush against any of the surfaces of the cave, you lose 50 energy units. You're also sucked back to the left side of the screen which is a problem because—you can ONLY exit the screen from the right.

GRAVITY AND SCORING

The gravity becomes heavier after every five screens. However, picking up a treasure turns off the gravity for a while—as well as giving you 1,000 points. You also get score points for picking up energy cubes, having leftover energy when you finish a screen, and simply staying alive. . .

*Max Langert, 13, lives in Oakland and may well be the youngest game programmer **Antic** ever published.*

Listing on page 63

Flight Simulator II

For Atari computers with 48K memory



Put yourself in the pilot's seat of a Piper 181 Cherokee Archer for an awe-inspiring flight over realistic scenery from New York to Los Angeles. High speed color-filled 3D graphics will give you a beautiful panoramic view as you practice takeoffs, landings, and aerobatics. Complete documentation will get you airborne quickly even if you've never flown before. When you think you're ready, you can play the World War I Ace aerial battle game. Flight Simulator II features include ■ animated color 3D graphics ■ day, dusk, and night flying modes ■ over 80 airports in four scenery areas: New York, Chicago, Los Angeles, Seattle, with additional scenery areas available ■ user-variable weather, from clear blue skies to grey cloudy conditions ■ complete flight instrumentation ■ VOR, ILS, ADF, and DME radio equipped ■ navigation facilities and course plotting ■ World War I Ace aerial battle game ■ complete information manual and flight handbook.

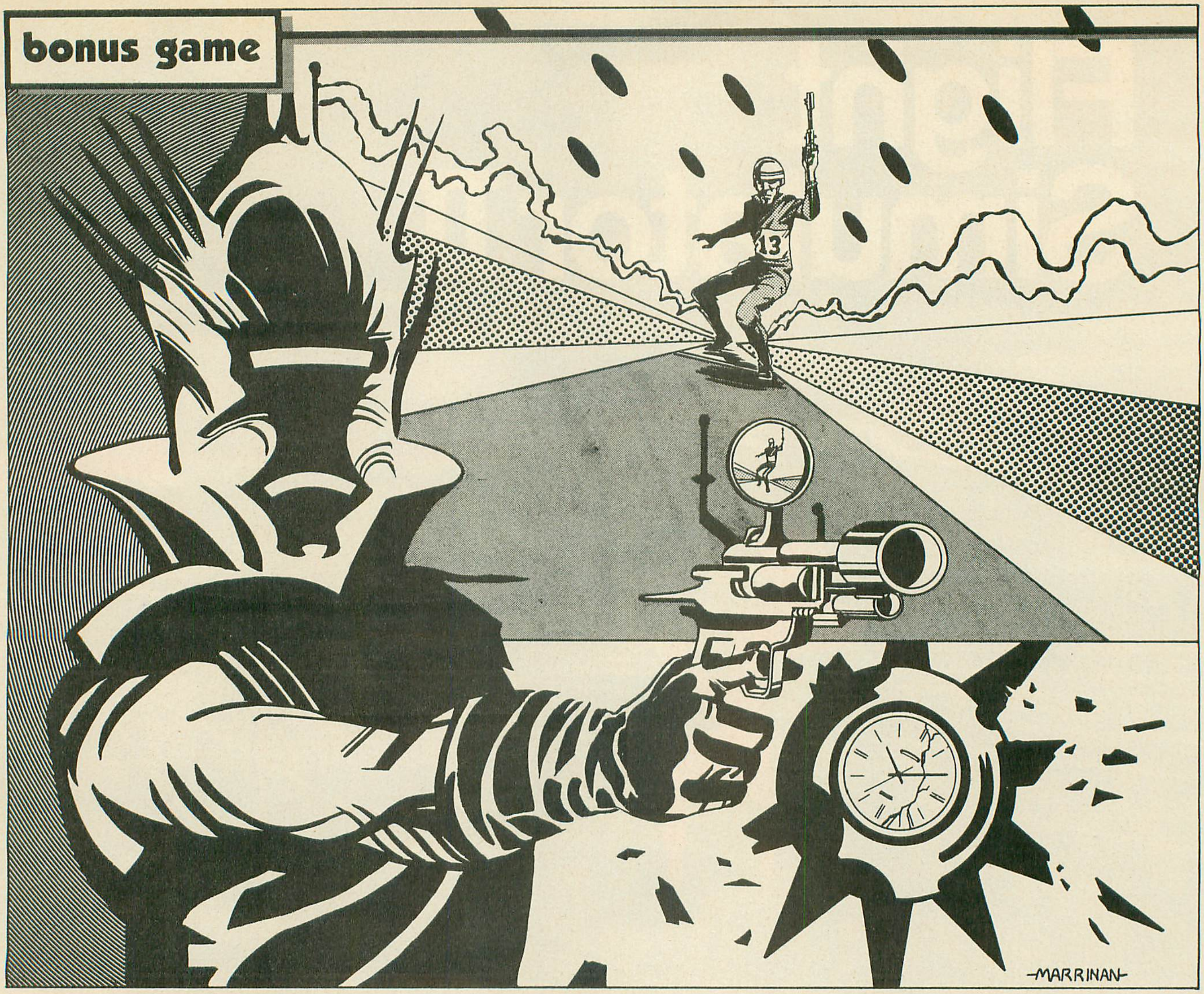
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bonus game



ZURK

by MICHAEL KRUEGER and JOHN SETTLES

Enter the Laserfighting event of the Zurkian Olympics! Only the winner of the first-place Aluminum Medal of Zurk survives. This fast-moving joystick BASIC game runs on any Atari computer.

Your space garbage scow crash-landed on the planet Zurk and you have been forced to sign up for the Zurkian Olympics. You are entered in the 18-round Laserfighting event . . . and there is no second place!

The arena is a rectangle surrounded by fatal laser barriers, with equally fatal laser obstacles scattered inside. For the first six rounds, you are shooting it out with a Zurkian Laserfighter dressed in black.

In the second six-round level, you must not only shoot the Zurk—you also have to grab the Zurkian Olympic Star before the timer runs out. The referees penalize failure with vaporization.

For the final six rounds, after you pick up the star it explodes into small Zurkian Olympic Pests which you must pick up before time runs out. After completing all three levels, the doors of the arena open and you emerge victorious.

Luckily you get four tries at the Aluminum Medal of Zurk. You also receive an extra try for every 2,000 points you earn.

HOW TO BEGIN

Type in the program, check it with TYPO II, and SAVE it to disk or cassette before you RUN it.

Michael Krueger and John Settles live in Vermillion, South Dakota when they are not visiting the planet Zurk.

Listing on page 65

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SYNAPSE

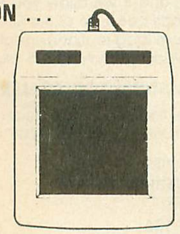
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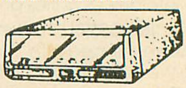
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SOFTWARE LIBRARY

Antic type-in listing section includes every full-length program from this issue. Listings are easier to type and proofread, easy to remove and save in a binder if you wish.

DISK SUBSCRIBERS: You can use all these programs immediately. Just follow the instructions in the accompanying magazine articles.

Antic program listings are typeset by Star's Gemini 10X Printer—From Star Micronics, Inc., 200 Park Avenue, New York, NY 10166.

TYPING SPECIAL ATARI CHARACTERS

Shown below are the Atari Special Characters as printed in **Antic** listings—and the keys you must type in order to get them. Boxes are drawn around the normal video characters here so you can see their positions more accurately, these boxes do not appear in the printed listings.

Whenever the CTRL key (CONTROL on XL models) or SHIFT key is used, *hold it down* while you press the next keys. Whenever the ESC key is used, *press and release* it before typing the next keys.

Turn on inverse video by pressing the Atari logo key 人 once. Turn it off by pressing a second time. (XL models use the Reverse Video Mode Key instead.)

Sometimes it's not easy to tell apart the following characters, shown here in both normal and inverse video. Be especially careful when you type any of these:

	CTRL F		/
	CTRL G		SHIFT +
	CTRL N		SHIFT -
	CTRL R		-
	CTRL S		+

NORMAL VIDEO

FOR THIS	TYPE THIS	FOR THIS	TYPE THIS
	CTRL ,		CTRL T
	CTRL A		CTRL U
	CTRL B		CTRL V
	CTRL C		CTRL W
	CTRL D		CTRL X
	CTRL E		CTRL Y
	CTRL F		CTRL Z
	CTRL G		ESC ESC
	CTRL H		ESC CTRL -
	CTRL I		ESC CTRL =
	CTRL J		ESC CTRL +
	CTRL K		ESC CTRL *
	CTRL L		CTRL .
	CTRL M		CTRL ;
	CTRL N		SHIFT =
	CTRL O		ESC SHIFT CLEAR
	CTRL P		
	CTRL Q		
	CTRL R		ESC DELETE
	CTRL S		ESC TAB

INVERSE VIDEO

FOR THIS	TYPE THIS	FOR THIS	TYPE THIS
	人CTRL ,		人CTRL Y
	人CTRL A		人CTRL Z
	人CTRL B		ESC SHIFT DELETE
	人CTRL C		
	人CTRL D		
	人CTRL E		ESC SHIFT INSERT
	人CTRL F		
	人CTRL G		
	人CTRL H		ESC CTRL TAB
	人CTRL I		
	人CTRL J		
	人CTRL K		ESC SHIFT TAB
	人CTRL L		
	人CTRL M		
	人CTRL N		人CTRL .
	人CTRL O		人CTRL ;
	人CTRL P		人SHIFT
	人CTRL Q		ESC CTRL 2
	人CTRL R		ESC CTRL DELETE
	人CTRL S		
	人CTRL T		
	人CTRL U		ESC CTRL INSERT
	人CTRL V		
	人CTRL W		
	人CTRL X		

HOW TO USE TYPO II

Type in TYPO II and SAVE a copy to disk or cassette.

Type GOTO 32000 and follow TYPO II onscreen instructions. If the resulting two-letter line codes are not exactly the same as those in the magazine, you mistyped something in that line.

To call back any line previously typed, type an asterisk [*] followed (without in-between spaces) by the line number, then press [RETURN]. This is also the way you use TYPO II to proofread itself.

To LIST your program, press [BREAK] and type LIST. To return to TYPO II, type GOTO 32000.

To remove TYPO II from your program, type LIST "D:FILENAME",0,31999 (Cassette owners LIST "C:). Type NEW, then ENTER "D:FILENAME" (Cassette—ENTER "C:). Your program is now in memory without TYPO II and you can SAVE or LIST it to disk or cassette.

BASIC XL cartridge owners type SET 5,0 and SET 12,0 before using TYPO II.

```
WB 32000 REM TYPO II BY ANDY BARTON
VM 32010 REM VER. 1.0 FOR ANTIC MAGAZINE
HS 32020 CLR :DIM LINE$(120):CLOSE #2:CLO
   SE #3
BN 32030 OPEN #2,4,0,"E":OPEN #3,5,0,"E"
YC 32040 ? "↖":POSITION 11,1:? "[illegible]"
EM 32050 TRAP 32040:POSITION 2,3:? "Type
   in a program line"
HS 32060 POSITION 1,4:? " ":INPUT #2;LINE
   $:IF LINE$="" THEN POSITION 2,4:LIST B
   :GOTO 32060
XH 32070 IF LINE$(1,1)="*" THEN B=VAL(LIN
   E$(2,LEN(LINE$))):POSITION 2,4:LIST B:
   GOTO 32060
TH 32080 POSITION 2,10:? "CONT"
MF 32090 B=VAL(LINE$):POSITION 1,3:? " ";
NY 32100 POKE 842,13:STOP
CN 32110 POKE 842,12
ET 32120 ? "↖":POSITION 11,1:? "[illegible]
   ":POSITION 2,15:LIST B
CE 32130 C=0:ANS=C
QR 32140 POSITION 2,16:INPUT #3;LINE$:IF
   LINE$="" THEN ? "LINE ";B;" DELETED":G
   OTO 32050
VV 32150 FOR D=1 TO LEN(LINE$):C=C+1:ANS=
   ANS+(C*ASC(LINE$(D,D))):NEXT D
WJ 32160 CODE=INT(ANS/676)
JW 32170 CODE=ANS-(CODE*676)
EH 32180 HCODE=INT(CODE/26)
BH 32190 LCODE=CODE-(HCODE*26)+65
HB 32200 HCODE=HCODE+65
IE 32210 POSITION 0,16:? CHR$(HCODE);CHR$
   (LCODE)
VG 32220 POSITION 2,13:? "If CODE does no
   t match press [illegible] and edit line a
   bove.":GOTO 32050
```

ERROR FILE

ADVENT X-5

NOV '84

If you're having trouble saving this to cassette, change line 4005 to read: IF PEEK (195)=130 THEN TRAP 4010:I$="C:":GOTO L

ADVENT X-5

NOVEMBER '84

Add the following line: 8020 RUN. If the program locks up, you may be mistyping line 1005, for which the TYPO II code is EJ.

ADVENTURE ISLAND

NOV '84

Line 837 should read: 837 DATA CYBERNETIC TANK, 999, 0, 6, 50 ,4

ADVENTURE ISLAND MEMORY

If you're getting an Error 2 (Insufficient memory) while running "Adventure Island" from our November, 1984 issue, it may be because you're using DOS-XL instead of Atari DOS 2.OS. "Adventure Island" is a big program and needs every bit of memory it can get. DOS-XL is a residnet DOS and does not leave enough memory for this particular program.

MISSING INFOBITS

DECEMBER '84

The AL source listing for Infobits (Dec. '84) was left out of the previous issue. You'll find it in the Jan. '85 Software Library.

LITTLE BROTHER INSTALLED PROPERLY

April '84

The schematic on page 106 shows resistor R11 to have a value of 2.2 Ohms. This should be 2.2 kilo Ohms.

ANTIC 4/5 EDITOR

October '84

To get this to run on XL machines, change both 36's in the lines 52 to 35, and change the 39 in line 522 to 38.

OCTOBER OMISSIONS October '84

A number of division signs [/] were omitted at the printer. On the magazine pages there is an empty space where they should have appeared. For specific corrections, see the December '84 or January '85 error file.

FONT MAKER

Article on page 16.

LISTING 1

```
XW 10 REM GEMINI 10X FONT MAKER
NE 15 REM BY JAMES DUFFIN
RG 20 REM ANTIC MAGAZINE
VS 30 GOSUB 2690:REM EXPLANATION
HF 40 GOSUB 2190:REM MEMORY MAP
CJ 50 GOSUB 2290:REM IOCB'S AND DIM'S
CE 60 GOSUB 2340:REM SCREEN SETUP
SE 70 POKE 731,90:GOTO 640
VF 80 REM MAIN LOOP
KX 90 REM (1) MOVE CURSOR
PQ 100 S=STICK(0):IF S=15 THEN GOTO 240
XL 110 PX=X:PY=Y:PZ=Z
QY 120 X=X+(S=5 OR S=6 OR S=7)-(S=9 OR S=
   10 OR S=11):Y=Y+(S=5 OR S=9 OR S=13)-(
   S=6 OR S=10 OR S=14)
YF 130 IF X>11 THEN X=3
SB 140 IF X<3 THEN X=11
LW 150 IF Y>9 THEN Y=3
NI 160 IF Y<3 THEN Y=9
JY 170 LOCATE X,Y,Z
EP 180 IF PZ=43 THEN POSITION PX,PY:? "+"
VS 190 IF PZ=20 THEN POSITION PX,PY:? "•"
NG 200 IF Z=20 THEN POSITION X,Y:? CHR$(1
   48)
JC 210 IF Z=43 THEN POSITION X,Y:? CHR$(1
   71)
VK 220 SPV=60:SDV=4:SVV=4:STV=2:GOSUB 265
   0
SB 230 GOTO 80
RN 240 REM (2) TRIGGER INPUT
AQ 250 IF STRIG(0)=1 THEN GOTO 300
SE 255 GOSUB 3000
LB 260 IF Z=20 THEN Z=43:POSITION X,Y:? C
   HR$(Z):GOTO 280
GZ 270 IF Z=43 THEN Z=20:POSITION X,Y:? C
   HR$(Z)
HI 280 SPV=6:SDV=6:SVV=10:STV=1:GOSUB 265
   0:GOSUB 3000:GOSUB 3000
SN 290 GOTO 80
FR 300 REM (3) KEYBOARD INPUT
XP 310 IN=PEEK(764):POKE 764,255:IF IN=25
   5 THEN 360
GH 320 IF IN=58 THEN D=1*(D=0):GOSUB 3000
   :GOSUB 1490
UL 330 IF IN=42 THEN SPV=60:SDV=10:STV=2:
   GOSUB 2650:GOSUB 1360:GOTO 640:REM "E"
   =EDIT
ZH 340 IF IN=62 THEN GOSUB 1360:GOSUB 960
   :GOTO 640:REM "S"=SAVE
WF 350 IF IN=0 THEN GOSUB 1360:GOSUB 1120
   :GOTO 640:REM "L"=LOAD
II 360 REM START PRESSED
NY 370 IF PEEK(53279)=6 THEN GOSUB 1360:G
   OSUB 1560:GOTO 660:REM "START"=LOAD PR
   INTER
LY 380 GOTO 100
JO 390 REM READ CHAR. TO GRID
XL 400 X=3:D=PEEK(CHORG+10*(C-32))
CT 410 Y=9:RESTORE 480:IF X>11 THEN SOUND
    0,0,0,0:RETURN
PW 420 T(X-2)=PEEK(CHORG+10*(C-32)+X-2)
BS 430 IF Y<3 THEN X=X+1:GOTO 410
TC 440 READ SUM
CY 450 IF T(X-2)>=SUM THEN T(X-2)=T(X-2)-
   SUM:POSITION X,Y:? "•"
NJ 460 IF T(X-2)<=0 THEN X=X+1:GOTO 410
DB 470 Y=Y-1:GOTO 430
XI 480 DATA 64,32,16,8,4,2,1
GT 490 REM PLOT CHAR POINTS
DB 500 POKE 88,SCL:POKE 89,SCH:POKE 87,8:
   FOR X=3 TO 11:FOR Y=3 TO 12:COLOR 0:PL
   OT OX+X,OY+Y:NEXT Y:NEXT X:X=3
IH 510 Y=9:RESTORE 580:IF X>11 THEN POKE
   88,TEXTL:POKE 89,TEXTH:POKE 87,0:COLOR
    32:PLOT 1,1:RETURN
PX 520 T(X-2)=PEEK(CHORG+10*(C-32)+X-2)
CV 530 IF Y<3 THEN X=X+1:GOTO 510
TD 540 READ SUM
VV 550 IF T(X-2)>=SUM THEN T(X-2)=T(X-2)-
   SUM:COLOR 1:PLOT OX+X,OY+Y+2*D
OS 560 IF T(X-2)<=0 THEN X=X+1:GOTO 510
DS 570 Y=Y-1:GOTO 530
XJ 580 DATA 64,32,16,8,4,2,1
BF 590 REM CHAR. LINE?
BC 600 IF C>=32 AND C<=62 THEN X=3+C-32:Y
   =15:OX=10*(C-32):OY=-1:D=PEEK(CHORG+10
   *(C-32))
LF 610 IF C>=63 AND C<=93 THEN X=3+C-63:Y
   =16:OX=10*(C-63):OY=9:D=PEEK(CHORG+10*
   (C-32))
LM 620 IF C>=94 AND C<=124 THEN X=3+C-94:
   Y=17:OX=10*(C-94):OY=19:D=PEEK(CHORG+1
   0*(C-32))
ZI 630 RETURN
GW 640 REM SELECT CHAR. TO EDIT
MJ 650 POSITION 16,5:? "*":POSITION 16,7:
   ? " ":POSITION 16,9:? " ":POSITION 16,
   11:? " "
TJ 660 X=3:Y=15:LOCATE X,Y,Z
LO 670 POSITION X,Y:? CHR$(Z+128*(Z<128))
   :GOSUB 2680
SX 680 S=STICK(0):IF S=15 THEN GOTO 800
YG 690 PX=X:PY=Y:PZ=Z
RA 700 X=X+(S=5 OR S=6 OR S=7)-(S=9 OR S=
   10 OR S=11):Y=Y+(S=5 OR S=9 OR S=13)-(
   S=6 OR S=10 OR S=14)
ZX 710 IF X>33 THEN X=3
VD 720 IF X<3 THEN X=33
RG 730 IF Y>17 THEN Y=15
RK 740 IF Y<15 THEN Y=17
KA 750 LOCATE X,Y,Z
TS 760 POSITION PX,PY:? CHR$(PZ)
IA 770 SPV=60:SDV=10:SVV=6:STV=2:GOSUB 26
   50
NF 780 POSITION X,Y:? CHR$(Z+128*(Z<128))
RM 790 GOTO 680
DZ 800 REM EXIT CHAR. SELECT
PJ 810 IF STRIG(0)=1 THEN GOTO 880
SC 815 GOSUB 3000
IT 820 SPV=81:SDV=10:SVV=6:STV=2:GOSUB 26
   50
TP 830 C=Z-128*(Z>128):GOSUB 590:GOSUB 39
   0:GOSUB 490
DL 840 X=3:Y=3:LOCATE X,Y,Z:POSITION X,Y:
   SPV=47:SDV=10:SVV=6:STV=2:GOSUB 2650
OB 850 ? CHR$(Z+128*(Z<128))
MU 860 IF STRIG(0)=0 THEN GOTO 860
SP 870 GOTO 80
IR 880 REM START PRESSED
PP 890 IF PEEK(53279)=6 THEN GOSUB 1560:R
   EM "START"=LOAD PRINTER
OQ 900 REM KEYBOARD INPUT
GQ 910 IN=PEEK(764):POKE 764,255:IF IN=25
   5 THEN 950
CG 920 IF IN=62 THEN POSITION X,Y:? CHR$(
   Z):GOSUB 960:GOTO 640:REM "S"=SAVE
```

```
ZP 930 IF IN=0 THEN POSITION X,Y:? CHR$(Z
):GOSUB 1120:GOTO 640:REM "L"=LOAD
BK 940 IF IN=58 THEN D=1*(D=0):GOSUB 1490
RG 950 GOTO 680
NG 960 REM SAVE FONT
TQ 970 POKE 712,218
SU 980 POSITION 16,5:? " ":POSITION 16,7:
? " ":POSITION 16,9:? "*":POSITION 16,
11:? " ":POSITION 16,13:? " "
GO 990 FILE$="":IN$="":INP$="Save Filena
me ":GOSUB 1990
GD 1000 POSITION 18,13:? "START Load Prin
ter"
NW 1010 TRAP 2140
AD 1020 OPEN #1,8,0,FILE$:GOSUB 3000:POKE
 850,11
BB 1030 POSITION 4,19:? "Saving Font...Pl
ease Stand By.  "
CU 1040 POKE 852,0:POKE 853,ORG:POKE 710,
8:POKE 712,8
MO 1050 POKE 856,0:POKE 857,4
GK 1060 E=USR(ADR(CIO$),16)
VI 1070 POKE 852,SCL:POKE 853,SCH
YW 1075 GOSUB 3000
NX 1080 POKE 856,0:POKE 857,5
GT 1090 E=USR(ADR(CIO$),16)
ZC 1095 GOSUB 3000
LY 1100 CLOSE #1:POKE 712,12:POKE 710,12:
TRAP 40000:POSITION 4,19:? "
                                "
JG 1110 GOSUB 2840:RETURN
XH 1120 REM LOAD FONT
BG 1130 POKE 712,218:N$=""
CK 1140 POSITION 16,5:? " ":POSITION 16,7
:? " ":POSITION 16,9:? " ":POSITION 16
,11:? "*":POSITION 16,13:? " "
VP 1150 FILE$="":IN$="":INP$="Load Filen
ame ":GOSUB 1990
GX 1160 POSITION 18,13:? "START Load Prin
ter"
OQ 1170 TRAP 2140
CC 1180 OPEN #1,4,0,FILE$:GOSUB 3000:POKE
 850,7
XK 1185 N$=FILE$(3)
OJ 1190 POSITION 4,19:? "Loading Font...P
lease Stand By. "
CM 1200 POKE 852,0:POKE 853,ORG:POKE 710,
8:POKE 712,8
MG 1210 POKE 856,0:POKE 857,4
GC 1220 E=USR(ADR(CIO$),16)
VA 1230 POKE 852,SCL:POKE 853,SCH
NP 1240 POKE 856,0:POKE 857,5
GL 1250 E=USR(ADR(CIO$),16)
YU 1255 GOSUB 3000
VX 1260 REM SHOW EDITED CHAR'S
MN 1270 C=32
AW 1280 GOSUB 590:IF C>124 THEN 1340
DZ 1290 POSITION X,Y:? CHR$(C)
DH 1300 FOR I=1 TO 9:T(I)=PEEK(CHORG+10*(
C-32)+I)
OO 1310 IF T(I)<>0 THEN POSITION X,Y:? CH
R$(C+128):I=9
FB 1320 NEXT I
VH 1330 C=C+1:GOTO 1280
NM 1340 CLOSE #1:POKE 710,12:POKE 712,12:
TRAP 40000:POSITION 4,19:? "
                                "
JW 1350 GOSUB 2840:RETURN
TY 1360 REM CHAR. TO RAM
LU 1370 FOR I=1 TO 9:T(I)=0:NEXT I
AG 1380 X=3
XZ 1390 Y=3:IF X>11 THEN GOTO 1470
AG 1400 IF Y>9 THEN GOTO 1450
ZV 1410 LOCATE X,Y,Z:IF Z=20 OR Z=148 THE
N GOTO 1430
XS 1420 POSITION X,Y:? "+":Y=Y+1:GOTO 140
0
ES 1430 T(X-2)=T(X-2)+(Y=3)+2*(Y=4)+4*(Y=
5)+8*(Y=6)+16*(Y=7)+32*(Y=8)+64*(Y=9)
XY 1440 POSITION X,Y:? "+":Y=Y+1:GOTO 140
0
OF 1450 POKE CHORG+10*(C-32)+X-2,T(X-2)
IL 1460 X=X+1:GOTO 1390
XW 1470 GOSUB 590:GOSUB 490
BF 1480 RETURN
JI 1490 REM DESCENDER
MM 1500 POSITION 16,5:? " ":POSITION 16,7
:? "*":POSITION 16,9:? " ":POSITION 16
,11:? " ":POSITION 16,13:? " "
BJ 1510 SPV=60-D*20:SDV=10:SVV=6:STV=2:GO
SUB 2650
ZM 1520 IF D=1 THEN POSITION 30,7:? "on/o
ff":POKE CHORG+10*(C-32),1
PE 1530 IF D=0 THEN POSITION 30,7:? "on/o
ff":POKE CHORG+10*(C-32),0
FG 1540 POSITION 16,5:? "*":POSITION 16,7
:? " ":POSITION 16,9:? " ":POSITION 16
,11:? " ":POSITION 16,13:? " "
AY 1550 RETURN
WY 1560 REM LOAD PRINTER
GK 1570 POSITION 16,5:? " "
DU 1580 POKE 712,56:POSITION 5,13:? "Is T
he Printer Ready (Y/N) ?        ":GOSUB
 2680
HC 1590 POKE 764,255
QJ 1600 IN=PEEK(764):IF IN=255 THEN GOTO
 1600
ES 1610 GOSUB 2680
OF 1620 IF IN=43 THEN POKE 764,255:GOTO 1
650:REM "Y"
CD 1630 IF IN=35 THEN POKE 764,255:GOTO 1
970:REM "N"
UH 1640 GOTO 1590
RJ 1650 TRAP 1910:OPEN #4,8,0,"P:":POSITI
ON 5,13:? " Downloading Font...Please
Wait "
PY 1660 REM LOAD PRINTER RAM NORMAL CHAR
TX 1670 PRINT #4;E$;CHR$(42);CHR$(0);
WB 1680 C=32:REM DOWNLOAD NEW CHAR'S
IV 1690 IF C>124 THEN GOTO 1750
CX 1700 FOR I=1 TO 9:T(I)=PEEK(CHORG+10*(
C-32)+I):NEXT I:D=PEEK(CHORG+10*(C-32)
)
SP 1710 SUM=T(1)+T(2)+T(3)+T(4)+T(5)+T(6)
+T(7)+T(8)+T(9):IF SUM=0 THEN C=C+1:GO
TO 1690:REM CHAR. THERE?
VS 1720 PRINT #4;E$;CHR$(42);CHR$(1);CHR$
(C);CHR$(D);
RT 1730 PRINT #4;CHR$(T(1));CHR$(T(2));CH
R$(T(3));CHR$(T(4));CHR$(T(5));CHR$(T(
6));CHR$(T(7));CHR$(T(8));CHR$(T(9));
ZF 1740 C=C+1:GOTO 1690
UJ 1750 REM SELECT DOWNLOADED CHAR'S
XX 1760 PRINT #4;E$;CHR$(36);CHR$(1);
MC 1770 REM PRINT CHARACTERS?
IF 1780 POKE 712,102:POSITION 5,13:? "Pri
nt Characters? (Y/N):        ":GOSUB
 2680
HG 1790 POKE 764,255
TP 1800 IN=PEEK(764):IF IN=255 THEN GOTO
 1800
PS 1810 IF IN=43 THEN POKE 764,255:GOTO 1
840:REM "Y"
AQ 1820 IF IN=35 THEN POKE 764,255:GOTO 1
960:REM "N"
RF 1830 GOTO 1800
VK 1840 REM PRINT
GW 1850 PRINT #4:PRINT #4,FILE$:PRINT #4
QK 1860 PRINT #4,:FOR I=32 TO 94:PRINT #4
;CHR$(I);:NEXT I
WC 1870 PRINT #4
EM 1880 PRINT #4,:FOR I=95 TO 124:PRINT #
4;CHR$(I);:NEXT I
UE 1890 PRINT #4:PRINT #4
UK 1900 GOTO 1960
HA 1910 REM TRAP PRINTER
XR 1920 FOR I=1 TO 3
PA 1930 POKE 712,0:POSITION 9,19:? "PRINT
```

continued on next page

```
   ER NOT CONNECTED !":GOSUB 2680
LJ 1940 POKE 712,66:POSITION 5,19:? "
                               ":GOSUB
    3000
XV 1950 NEXT I:TRAP 40000
PG 1960 CLOSE #4
XL 1970 POKE 712,12:POSITION 5,13:? "
        START Load Printer ":GOSUB 28
   40
OV 1980 POSITION 16,5:? "*":GOSUB 2680:RE
   TURN
FU 1990 REM DISK DIRECTORY
NC 2000 GRAPHICS 0:POKE 710,218:POKE 712,
   218:POKE 709,0:POKE 752,1:TRAP 2080
WE 2010 POSITION 13,0:? "DISK DIRECTORY"
IV 2020 OPEN #1,6,0,"D:*.FNT"
CU 2030 INPUT #1,IN$
TE 2050 IF ASC(IN$(1,1))>46 THEN 2030
HO 2060 IF IN$(3,9)="AUTORUN" THEN 2030
SR 2070 ? :? "                 ";IN$(1,14);:GOT
   O 2030
FQ 2080 CLOSE #1:TRAP 2140:GOSUB 2840
HF 2090 POSITION 7,22:? INP$;
ZU 2095 POSITION 25,22:? N$:POSITION 24,2
   2
SE 2100 INPUT IN$:IF IN$(1,2)<>"D:" THEN
   FILE$(1,2)="D:":FILE$(3,20)=IN$
JC 2110 IF IN$(1,2)="D:" THEN FILE$=IN$
AB 2115 FOR I=1 TO LEN(FILE$):IF FILE$(I,
   I)="." THEN FILE$(I)=".FNT":POP :GOTO
   2120
FT 2116 NEXT I
ZL 2117 FILE$(I-1)=".FNT"
LF 2120 POKE 560,DLL:POKE 561,DLH:POKE 88
   ,TEXTL:POKE 89,TEXTH:POKE 710,12:IN$="
   "
XV 2130 POKE 709,4:RETURN
RJ 2140 POKE 560,DLL:POKE 561,DLH:POKE 88
   ,TEXTL:POKE 89,TEXTH:POKE 710,8:POKE 7
   12,8:IN$="":POKE 709,4
NB 2150 CLOSE #1
KA 2160 POSITION 4,19:? "      Cannot ";IN
   P$(2,5);" Font!           ":GOSUB
   2680
OA 2170 GOSUB 3000:GOSUB 3000:POKE 710,12
   :POKE 712,12
IP 2180 POP :TRAP 40000:POSITION 4,19:? "
                               ":GOTO 640
GY 2190 REM MEMORY MAP
IK 2200 RAMTOP=PEEK(106):ORG=RAMTOP-48
DX 2210 CHORG=256*ORG
SL 2220 POKE 88,0:POKE 89,ORG:? CHR$(125)
   :REM CLEAR CHARACTER MEMORY
OG 2230 DLL=0:DLH=RAMTOP-44:DL=DLL+256*DL
   H
LG 2240 TEXTL=0:TEXTH=RAMTOP-40:TEXT=TEXT
   L+256*TEXTH
QL 2250 POKE 88,0:POKE 89,TEXTH:? CHR$(12
   5):REM CLEAR TEXT MEMORY
JN 2260 SCL=0:SCH=RAMTOP-32:SC=SCL+256*SC
   H
PY 2270 POKE 88,0:POKE 89,SCH:? CHR$(125)
   :REM CLEAR SCREEN MEMORY
BC 2280 RETURN
DP 2290 REM IOCB'S AND DIM'S
TO 2300 DIM T(9):DIM E$(5):E$=CHR$(27)
GI 2310 DIM IN$(20),FILE$(20),CIO$(7),N$(
   17)
KH 2320 CIO$="hhh■LV■":D=0
AP 2330 RETURN
BO 2340 REM SCREEN SETUP
XK 2350 GRAPHICS 0:POKE 709,4:POKE 710,12
   :POKE 712,12:POKE 752,1:GOSUB 2840
BB 2360 POKE DL,112:POKE DL+1,112:POKE DL
   +2,112:POKE DL+3,66:POKE DL+4,TEXTL:PO
   KE DL+5,TEXTH
FT 2370 FOR I=6 TO 24:POKE DL+I,2:NEXT I
HZ 2380 POKE DL+25,79:POKE DL+26,SCL:POKE
    DL+27,SCH
YJ 2390 FOR I=28 TO 59:POKE DL+I,15:NEXT
   I
RI 2400 POKE DL+58,65:POKE DL+59,DLL:POKE
    DL+60,DLH
GN 2410 POKE 560,DLL:POKE 561,DLH:POKE 88
   ,TEXTL:POKE 89,TEXTH:POKE 87,0
PL 2420 FOR I=39968 TO 40000:POKE I,0:NEX
   T I
EW 2430 ? :? :? " ◢■■■■■■■■■■"
VG 2440 ? " |++++++++++■"
VJ 2450 ? " |++++++++++■"
VM 2460 ? " |++++++++++■"
VP 2470 ? " |++++++++++■"
VS 2480 ? " |++++++++++■"
VV 2490 ? " |++++++++++■"
DI 2500 ? " |++++++++++◤"
AL 2510 ? " ────────── "
WA 2520 POSITION 18,3:? "KEYBOARD COMMAND
   S"
PI 2530 POSITION 18,5:? "E Edit Next Char
   acter"
GK 2540 POSITION 18,7:? "D Descender on/O
   ff"
GS 2550 POSITION 18,9:? "S Save Font"
MN 2560 POSITION 18,11:? "L Load Font"
VU 2570 POSITION 3,11:? "Dot Matrix"
NR 2580 POSITION 5,13:? "             STA
   RT Load Printer"
GT 2590 POSITION 9,0:? "GEMINI 10X FONT M
   AKER":POSITION 15,1:? "by James Duffin
   "
YC 2600 POSITION 3,15:FOR I=32 TO 62:? CH
   R$(I);:NEXT I
HX 2610 POSITION 3,16:FOR I=63 TO 93:? CH
   R$(I);:NEXT I
ID 2620 POSITION 3,17:FOR I=94 TO 124:? C
   HR$(I);:NEXT I
KC 2630 DIM INP$(17)
AY 2640 RETURN
VV 2650 SOUND 0,SPV,SDV,10:POKE 20,0
EN 2660 IF PEEK(20)<STV THEN 2660
YI 2670 SOUND 0,0,0,0:RETURN
YK 2680 POKE 544,100
JP 2682 SOUND 0,35,14,INT(PEEK(544)/15):I
   F PEEK(544)>0 THEN 2682
DB 2684 SOUND 0,0,0,0:POKE 66,0:RETURN
IJ 2690 REM EXPLANATION
EL 2700 GRAPHICS 0:POKE 712,30:POKE 710,3
   0:POKE 709,0:POKE 752,1:GOSUB 2840
JA 2710 ? :? "The Gemini 10X Font Maker":
   ? "          by JAMES DUFFIN":? "
   is a program which allows you to"
TT 2720 ? "make your own character sets a
   nd":? "download them to a Gemini 10X p
   rinter."
BS 2730 ? "Once downloaded, the printer w
   ill use this font until switched off."
TB 2740 ? :? "IMPORTANT! When making the
   dot image":? "of a character, horizont
   al dots must"
GZ 2750 ? "have one space between them, b
   ut":? "vertical dots need not."
TI 2760 ? :? "Use the joystick and button
    to select":? "the character to edit,
   and then use"
FE 2770 ? "the joystick and button to mak
   e the":? "dot image. Press D to toggle
    the"
VC 2780 ? "descender mode on/off, and E t
   o store"
JQ 2790 ? "the image and edit the next ch
   aracter."
YK 2800 ? "        PRESS ANY KEY TO BEGIN"
AL 2810 IF PEEK(764)=255 THEN 2810
CD 2830 POKE 764,255:RETURN
MF 2840 REM DISABLE BREAK KEY
ML 2850 I=PEEK(16):IF I>127 THEN I=I-128:
   POKE 16,I:POKE 53774,I
NN 2860 POKE 77,0
BL 2870 RETURN
```

```
GX 3000 POKE 20,0
HN 3010 IF PEEK(20)<3 THEN 3010
AH 3020 RETURN
```

LISTING 2

```
HD 10 REM EPSON FX80 FONT MAKER
BD 410 Y=3:RESTORE 480:IF X>11 THEN SOUND
    0,0,0,0:RETURN
ES 430 IF Y>9 THEN X=X+1:GOTO 410
CL 470 Y=Y+1:GOTO 430
IR 510 Y=3:RESTORE 580:IF X>11 THEN SOUND
    0,0,0,0:POKE 88,TEXTL:POKE 89,TEXTH:P
   OKE 87,0:RETURN
FV 530 IF Y>9 THEN X=X+1:GOTO 510
DC 570 Y=Y+1:GOTO 530
BO 1430 T(X-2)=T(X-2)+64*(Y=3)+32*(Y=4)+1
   6*(Y=5)+8*(Y=6)+4*(Y=7)+2*(Y=8)+(Y=9)
QU 1580 POKE 712,56:POSITION 5,13:? "IS
   DIP switch 1-4 off? (Y/N) ":GOSUB 268
   0
RJ 1630 IF IN=35 THEN POKE 764,255:POSITI
   ON 5,13:? " TURN OFF DIP SWITCH 1-4
     ":GOSUB 2680:GOTO 1970
NG 1670 PRINT #4;E$;CHR$(58);CHR$(0);CHR$
   (0);CHR$(0);
BD 1720 PRINT #4;E$;CHR$(38);CHR$(0);CHR$
   (C);CHR$(C);:IF D=0 THEN PRINT #4;CHR$
   (139);
YG 1725 IF D=1 THEN PRINT #4;CHR$(11);
GK 1735 PRINT #4;CHR$(0);CHR$(0);
BV 1760 PRINT #4;E$;CHR$(37);CHR$(1);CHR$
   (0);
GS 2590 POSITION 9,0:? "EPSON FX80 FONT M
   AKER":POSITION 15,1:? "by James Duffin
   "
FF 2710 ? :? "The EPSON FX80 Font Maker":
   ? "                 by JAMES DUFFIN":? "
     is a program which allows you to"
CY 2720 ? "make your own character sets a
   nd":? "download them to an Epson FX80
   printer"
```

now print those Atari special characters!

CUSTOM PRINT

Article on page 21.

LISTING 1

```
NH 1 REM CUSTOM PRINT
KN 2 REM BY MATTHEW J.W. RATCLIFF
OK 3 REM ANTIC MAGAZINE
UA 5 CS=PEEK(106)-8:POKE 106,CS:GRAPHICS
   0:DIM CST$(20):CST$=""
BP 10 DIM PROG$(182):CSET=0:GRAPHICS 0:OS
   ET=PEEK(756)
DI 20 DATA 104,240,10,201,2,240,7,170,104
   ,104,202,208,251,96
WP 30 DATA 104,133,213,104,133,212,104,10
   4,133,216,160,0,177,212
PP 40 DATA 230,212,208,2,230,213,160,0,13
   2,217,201,128,144,4
VQ 50 DATA 41,127,198,217,170,133,218,224
   ,96,176,11,169,64,224
LG 60 DATA 32,144,2,169,224,24,101,218,13
   3,214,169,0,133,215
FH 70 DATA 162,3,6,214,38,215,202,208,249
   ,24,173,244,2,101
JW 80 DATA 215,133,215,160,0,240,2,208,18
   7,162,0,177,214,230
IH 90 DATA 214,208,2,230,215,69,217,149,2
   28,232,224,8,208,239
ST 100 DATA 162,0,22,228,42,232,224,8,208
   ,248,153,220,0,200
GH 110 DATA 192,8,208,238,162,0,181,220,2
   01,155,208,4,169,151
LM 120 DATA 149,220,232,224,8,208,241,162
   ,112,169,11,157,66,3
CR 130 DATA 169,220,157,68,3,169,0,157,69
   ,3,169,0,157,73
XH 140 DATA 3,169,8,157,72,3,32,86,228,19
   8,216,208,166,96
IQ 150 RESTORE 20:FOR I=1 TO 182:READ A:P
   ROG$(I,I)=CHR$(A):NEXT I:PROG$(136,136
   )=CHR$(155)
EG 160 DIM A$(480),B$(240),C$(240),F$(20)
   ,TTL$(120),DRV$(8):OPEN #2,4,0,"K:"
UH 170 ? "K":POKE 710,114:? "↓I ICUSTOM PR
   INT I I By Mat Rat "
UZ 175 GOSUB 900
RO 180 ? "Directory of  TEXT-FILES  DISK"
   :GOSUB 2400
YN 190 ? "Text filename to  CUSTOM-PRINT.
   ..":GOSUB 2510
IN 250 ? "K":? "CHARACTERS PER LINE:"
HW 260 ? "[1] 60 [2] 120 [3] 240 ";:GET #
   2,A:? CHR$(27);CHR$(A)
UN 270 A=A-48:IF A<1 OR A>3 THEN ? "VALU
   E ERROR!":GOTO 260
OQ 280 CL=A*60:IF A=3 THEN CL=CL+60
FC 290 ON A GOTO 300,310,320
SX 300 DENS=ASC("K"):GOTO 330:REM NORMAL
   DENSITY GFX
TJ 310 DENS=ASC("L"):GOTO 330:REM DUAL DE
   NSITY GFX
CT 320 DENS=ASC("z"):REM QUAD DENSITY GFX
TQ 330 ? "K":? "VERTICAL LINE SPACING:"
US 340 ? "[1] Stacked [2] Single"
WV 350 ? "(Stacked will appear"
MJ 360 ? "exactly as ATARI screen) ";:GET
   #2,A:? CHR$(27);CHR$(A)
HL 370 A=A-48:VS=8*A:IF A<1 OR A>2 THEN ?
   "RANGE ERROR":GOTO 340
MH 380 ? "K":? "TEXT CONTROL:"
WK 390 ? "[1] Center Text [2] Block Left"
HH 400 ? "[3] Block Right (block left nor
   mal)";:GET #2,A:? CHR$(27);CHR$(A)
CJ 410 A=A-48:IF A<1 OR A>3 THEN ? "RANG
   E ERROR":GOTO 390
LX 420 CRCTL=A:? :? "Type a TITLE & press
   RETURN key ":INPUT TTL$:PG=1
PX 422 IF LEN(TTL$)>0 THEN GOTO 428
DU 424 ? "Skip Perforations (Y/N) ";:TRAP
   424:GET #2,A:IF A=ASC("N") THEN PG=0:
   GOTO 430
AB 425 IF A=ASC("Y") THEN PG=-1:GOTO 430
QB 426 GOTO 424
VE 428 IF PG THEN TTL$(LEN(TTL$)+1)="  PG
   "
GN 430 ? "K":? "* GET PRINTER READY *"
VV 440 ? "AND BE SURE DISK WITH LISTED"
HV 450 ? "FILE ";F$;" IS READY "
```

continued on next page

```
QD 460 ? "AND PRESS RETURN KEY ";:GET #2,
      A:? :?
DF 462 ? "PRESS  ESCAPE KEY  TO ABORT "
XY 465 IF CSET<>0 THEN POKE 756,CSET
GQ 470 TRAP 800:CLOSE #1:OPEN #1,4,0,F$
NN 480 CLOSE #7:OPEN #7,8,0,"P:"
VC 490 ? #7;"←A";CHR$(VS);:REM SET VERTIC
      AL SPACING
UA 500 ? #7;"←N";CHR$(0);:? #7;"←O":REM S
      ET FORM SKIP FEATURE TO 0. COUNT FORMS
NJ 510 TRAP 800:LINES=0:IF PG THEN GOSUB
      2200
DL 520 IF LINES>=48*(VS=16)+96*(VS=8)-8 A
      ND PG<>0 THEN GOSUB 2180
PD 522 IF PEEK(764)<>255 THEN GET #2,A:IF
       A=27 THEN GOTO 830
SI 525 INPUT #1,A$:B$="":LINES=LINES+1:IF
       LEN(A$)>CL THEN LINES=LINES+1:B$=A$(C
      L+1):A$(CL+1)=""
KB 530 IF A$="" THEN GOTO 665
IG 540 REM SET UP A$ ACCORDING TO PRINT C
      ONTROL
WP 550 ON CRCTL GOTO 560,640,600
TR 560 A=INT((CL-LEN(A$))/2):IF A=0 THEN
      640
LC 570 C$(1)=" ":C$(240)=" ":C$(2)=C$
BV 580 C$(A)=A$:A$="":A$=C$:GOTO 640
CG 600 IF LEN(A$)=CL THEN 640
RQ 610 C$=A$:A$(1)=" "
BL 620 A$(480)=" ":A$(2)=A$
KA 630 A$(CL-LEN(C$))=C$
IV 640 A=8*LEN(A$):HI=INT(A/256):LO=A-256
      *HI
XE 650 ? #7;CHR$(27);CHR$(DENS);CHR$(LO);
      CHR$(HI);
DY 660 A=USR(ADR(PROG$),ADR(A$),LEN(A$))
LD 665 ? #7
FJ 670 IF B$<>"" THEN A$=B$:B$="":GOTO 55
      0
OL 680 GOTO 520
EB 800 IF PEEK(195)=136 THEN GOTO 850
MV 810 ? "* ERROR ";PEEK(195);" AT LINE "
      ;PEEK(186)+256*PEEK(187);" *"
IS 820 CLOSE #1:CLOSE #7:GOTO 175
PD 830 POKE 756,OSET:CLOSE #1:CLOSE #7:?
      " * PRINT ABORTED *"
RB 840 GOTO 860
QH 850 POKE 756,OSET:? :? "* END OF FILE
      REACHED *"
IO 860 ? :? "[1] More lists [2] Quit ";:G
      ET #2,A:A=A-48
RA 870 IF A<1 OR A>2 THEN ? "↰RANGE ERROR
      ":GOTO 860
CP 875 CLOSE #1:CLOSE #7
ZO 880 ON A GOTO 170,890
FP 890 POKE 106,PEEK(106)+8:GRAPHICS 0:?
      "* END *":END
RU 900 ? :? "[1] Load & Print with"
TG 910 ? "    custom character set."
HJ 920 ? "[2] Print with ATARI Set."
NU 922 IF CST$<>"" THEN ? "[3] Use ";CST$
      ;" to print."
UU 930 TRAP 960:GET #2,A:A=A-48:? A
AA 940 IF A=1 THEN 970
JE 950 IF A=2 THEN CSET=0:RETURN
QI 955 IF A=3 THEN CSET=CS:RETURN
DM 960 ? "↰INPUT ERROR. 1 OR 2 ?":GOTO 93
      0
AX 970 ? "Directory of C-SET disk:":GOSUB
       2400
AH 980 ? " C-SET  Filename to load...":GO
      SUB 2500
HM 1100 CSET=CS:? "↰":FOR I=0 TO 255:? CH
      R$(27);CHR$(I);:NEXT I:?
VD 1110 ? "Working..."
LP 1120 TRAP 2000
VU 1130 CLOSE #3:OPEN #3,4,0,F$:CST$=F$
ZQ 1140 POKE 756,CSET
KP 1150 POKE 882,7:POKE 884,0:POKE 885,CS
      ET
YW 1160 POKE 888,0:POKE 889,128
TX 1170 A=USR(ADR("hW0LV"))
ON 1180 LN=256*PEEK(889)+PEEK(888):ER=PEE
      K(883):CLOSE #3:POKE 756,OSET
JV 1190 IF LN<>1024 THEN ? "↰ NOT VALID
      CHARACTER SET >";F$:GOTO 900
ME 1200 IF ER<>136 THEN ? "* I/O ERROR ";
      ER;" *":GOTO 900
WL 1210 POKE 756,OSET:RETURN
KL 2000 ? "↰I/O ERROR ";PEEK(195);
YK 2010 ? " AT LINE ";PEEK(186)+256*PEEK(
      187):CLOSE #1:CLOSE #2:CLOSE #3:END
NJ 2100 TRAP 2130
II 2110 CLOSE #5:OPEN #5,4,0,F$
FK 2120 CLOSE #5:RETURN
ZS 2130 CLOSE #5:F$="":RETURN
NX 2180 IF LINES=VS*6-8 OR LINES=0 THEN ?
       #7
IV 2190 FOR I=1 TO 6+(VS=8):? #7:NEXT I:?
       #7;"←A";CHR$(8):? #7;"←A";CHR$(VS);
WE 2200 ? #7:? #7:IF PG<0 THEN GOTO 2270
MI 2210 A=LEN(TTL$)*8:HI=INT(A/256):LO=A-
      256*HI
ZD 2220 ? #7;CHR$(27);CHR$(DENS);CHR$(LO)
      ;CHR$(HI);
CM 2230 A=USR(ADR(PROG$),ADR(TTL$),LEN(TT
      L$))
SH 2240 A$=STR$(PG):PG=PG+1:A=8*LEN(A$):H
      I=INT(A/256):LO=A-256*HI
ZM 2250 ? #7;CHR$(27);CHR$(DENS);CHR$(LO)
      ;CHR$(HI);
LJ 2260 A=USR(ADR(PROG$),ADR(A$),LEN(A$))
HM 2270 ? #7:? #7
FI 2290 LINES=1:RETURN
FL 2400 TRAP 2400:? "DRIVE # (1-4) ";:GET
       #2,A:A=A-48:? A
RC 2410 IF A<1 OR A>4 THEN 2400
JM 2420 DRV$="D":DRV$(2,2)=STR$(A):DRV$(3
      ,3)=":"
SQ 2430 F$=DRV$:F$(4)="*.*"
ZU 2440 CLOSE #1:TRAP 2000:OPEN #1,6,0,F$
      :I=1:? "↰":? "   DISK DIRECTORY FOR DR
      IVE #(";CHR$(A+176);")         "
CP 2450 INPUT #1,A$:? A$;:IF A$(4,5)=" F"
       THEN 2490
CH 2460 IF INT(I/2)=I/2 THEN ? :GOTO 2480
BB 2470 ? " ||";
ZB 2480 I=I+1:GOTO 2450
UP 2490 CLOSE #1:? :? "              > END O
      F FILE <":RETURN
FM 2500 ? "From drive # ";DRV$
HD 2510 ? "<TYPE filename.ext ONLY & PRES
      S RTN>"
CT 2520 ? "Press RTN only for another DIR
      ECTORY"
NQ 2530 TRAP 2530:INPUT A$:IF LEN(A$)=0 T
      HEN GOSUB 2400:GOTO 2500
IJ 2540 F$=DRV$:F$(4)=A$
NU 2550 TRAP 2560:CLOSE #5:OPEN #5,4,0,F$
      :CLOSE #5:GOTO 2570
GZ 2560 CLOSE #5:? "↰File ";F$;" does not
       exist":GOTO 2510
BF 2570 RETURN
```

LISTING 2

```
AI 95 REM NECFIX - IMPORTANT TO INCLUDE
DA 96 REM ALL REM LINES!!
WG 100 DATA 162,0,22,228,106,232,224,8,20
      8,248,153,220,0,200
SP 165 DIM D$(10)
ZC 250 DENS=ASC("S"):CL=60
QI 260 REM ONLY 60 CHARACTERS/LINE ON NEC
IL 270 REM SINCE SINGLE DENSITY GRAPHICS
      ONLY.
RD 280 REM
RF 290 REM
OO 300 REM
```

```
QQ 310 REM
QS 320 REM
VI 370 A=A-48:VS=16*A:IF A<1 OR A>2 THEN
   ? "▣RANGE ERROR":GOTO 330
YP 490 ? #7;"␛T";STR$(VS);
LJ 500 ? #7;CHR$(24);:REM CANCEL LOGIC SE
   EKING MODE FOR BETTER COLUMNAR PRINTS
ZQ 520 IF LINES>=48*(VS=32)+96*(VS=16)-8
   AND PG<>0 THEN GOSUB 2180
CL 640 A=8*LEN(A$):GOSUB 2600
KO 650 ? #7;CHR$(27);CHR$(DENS);D$;
ZK 2190 FOR I=1 TO 5+(VS=16):? #7:NEXT I:
   ? #7;"␛T16":? #7;"␛T";STR$(VS);
FT 2210 A=LEN(TTL$)*8:GOSUB 2600
CS 2220 ? #7;CHR$(27);CHR$(DENS);D$;
KO 2240 A$=STR$(PG):PG=PG+1:A=8*LEN(A$):G
   OSUB 2600
DB 2250 ? #7;CHR$(27);CHR$(DENS);D$;
EX 2600 D$="0000":D=(A>9)+(A>99)+(A>999):
   D$(4-D,4)=STR$(A):RETURN
```

the screen dump you've been waiting for

KWIK DUMP

Article on page 12.

LISTING 1

```
SH 10 REM QUICK DUMP
MV 20 REM (C) 1984 BY JERRY ALLEN
BC 30 REM P.O. BOX 2205, REDONDO BEACH
VO 40 REM CALIF. 90278
MS 100 REM INTITIALIZATION
MJ 110 TRAP 500:DIM LOD$(28),A$(81),PRNT$
   (192),GRAF$(6),J$(18),FILE$(18),KLR$(6
   )
IJ 120 GOTO 1010:REM ****DON'T TYPE THIS
    LINE OR 1000 TO END IF YOU DON'T NEED
    HELP WITH THE NEXT TWO LINES*********
GD 130 LOD$="h▯◣▬R┘h▬U┘h▬T┘h▬Y┘h▬X┘▥+ V▣◆
   "
CW 140 A$="hh▖Lh▖Kh▖Nh▖M▬♥:Oh h▖P▬♥1KI␛P )
   LI P )▘SO▖MH:Oeep ▨PI 0▔8▨Ki(▖K0VF▬☆R┴
   ▨Ki(▖K☆IfL0E◆"
EA 150 A$(27,27)=CHR$(155):PRNT$="♥":PRNT
   $(192)=PRNT$:PRNT$(2)=PRNT$:POKE 710,0
   :POKE 709,40
IX 160 ? "↖CHOOSE:":? "1 EPSON/GEMINI":?
   "2 NEC 8023":? "3 PROWRITER 8510":INPU
   T T:GOSUB 600+T
NN 200 REM GET DIRECTORY
BE 210 CLOSE #1:? "↖":POKE 710,0:POKE 709
   ,40:? "INSERT DISK DRIVE #1, PRESS RET
   URN":INPUT J$:OPEN #1,6,0,"D:*.*"
JP 220 ? "↖":TRAP 230:FOR N=0 TO 63:INPUT
    #1,FILE$:POSITION 2+19*((N/2)=INT(N/2
   )),INT(N/2):? FILE$;:NEXT N
QO 230 TRAP 500:POP :CLOSE #1:? :? "ENTER
    FILENAME";:INPUT FILE$
QC 240 IF FILE$(1,2)<>"D:" AND FILE$(1,3)
   <>"D1:" AND FILE$(1,3)<>"D2:" THEN J$=
   FILE$:FILE$(1,2)="D:":FILE$(3)=J$
DQ 300 REM FILL SCREEN
HB 310 GRAPHICS 8+16:POKE 710,15:POKE 709
   ,0:CLOSE #1:OPEN #1,4,0,FILE$:SLOC=PEE
   K(88)+PEEK(89)*256
ZA 320 X=USR(ADR(LOD$),SLOC,7680):CLOSE #
   1
SN 400 REM PRINT ROUTINE
IN 410 OPEN #1,8,0,"P:":SLOC=SLOC+START
SX 420 FOR N=A TO B STEP C:X=USR(ADR(A$),
   SLOC+N,ADR(PRNT$),T):? #1;GRAF$;PRNT$:
   NEXT N:POKE 764,255
EA 430 IF PEEK(764)=255 THEN 430
QQ 440 POKE 764,255:GOTO 210
SA 500 REM ERROR ROUTINE
KR 510 ? "↖":A=PEEK(195):IF A=170 THEN ?
   "BAD FILENAME!"
HH 520 IF A=138 THEN ? "DEVICE TURNED OFF
    OR NOT CONNECTED!"
MD 530 IF A=5 OR A=8 OR A=12 THEN ? "INPU
   T ERROR!"
QN 540 ? "ERROR ";A;" @ ";PEEK(186)+PEEK(
   187)*256
WH 550 FOR N=1 TO 500:X=USR(ADR("h▨●▬E |◆"
   )):NEXT N:RUN
VC 600 REM PRINTER CODES
AR 601 GRAF$="␛K@♥":LPRINT "␛A◢":KLR$="␛@
   ":A=0:B=39:C=1:START=7640:RETURN
YH 602 GRAF$="␛S0192":LPRINT "␛>␛T16␛N":K
   LR$="␛<␛A␛N":A=39:B=0:C=-1:START=0:RET
   URN
JW 603 GRAF$="␛S0192":LPRINT "␛[␛T16␛N":K
   LR$="␛]␛A␛N":A=39:B=0:C=-1:START=0:RET
   URN
NN 1000 REM *****SELF DELETING STRING WRI
   TER SECTION*****
VR 1010 RESTORE :? "↖120"
UQ 1020 ? "130 LOD$=";CHR$(34);:POKE 766,
   1:FOR N=1 TO 28:READ A:? CHR$(A);:NEXT
    N:?
AQ 1030 ? "140 A$=";CHR$(34);:FOR N=1 TO
   81:READ A:? CHR$(A);:NEXT N:?
QZ 1040 ? 1000:? 1010:? 1020:? 1030:? 104
   0:? 1050:? 1060:? 1070:? 1080:? 1090:?
    1100
UG 1050 ? :? "MOVE CURSOR TO LINE NUMBERS
   ":? "THEN PRESS RETURN":? "THEN SAVE A
   ND RUN AGAIN":POKE 766,0
VT 1060 DATA 104,169,7,141,82,3,104,141,8
   5,3,104,141,84,3,104,141,89,3,104,141,
   88,3,162,16,32,86,228,96
YJ 1070 DATA 104,104,133,204,104,133,203,
   104,133,206,104,133,205,160,0,132,207,
   104,104,133,208,160,0,177,203,201,0
JN 1080 DATA 208,2,169,154,201,13,208,2,1
   69,12,164,207,145,205,200,132,207,192,
   192,240,32,165,208,201,2,176,13,56
DO 1090 DATA 165,203,233,40,133,203,176,2
   14,198,204,144,210,24,165,203,105,40,1
   33,203,144,201,230,204,176,197,96
KV 1100 REM ␛=ESC,ESC  ↖=ESC,SHIFT+CLEAR
   ◢=CTRL+H  ●=CTRL+T  |=CTRL+B  ▬=INV,C
   TRL+M  ◆=CTRL+.  ♥=CTRL+,
```

LISTING 2

```
NE 10 REM QUICK SAVE
MV 20 REM (C) 1984 BY JERRY ALLEN
BC 30 REM P.O. BOX 2205, REDONDO BEACH
VO 40 REM CALIF. 90278
MS 100 REM INITIALIZATION
```

continued on next page

```
BV 110 DIM SAV$(28)
LC 130 SAV$="h▯ ▀▄R┘h▄U┘h▄T┘h▄Y┘h▄X┘Ш♣ V◙◆
       "
IF 140 REM ="h▯ "=CNTL+K (THIRD CHAR) SEE
          LOD$ PROGRAM 1 FOR REST OF LINE
DP 200 REM FILL SCREEN
UP 210 GRAPHICS 24:COLOR 1
LA 220 FOR N=0 TO 10:PLOT N,N:DRAWTO 319-
       N,0+N:DRAWTO 319-N,191-N:DRAWTO 0+N,19
       1-N:DRAWTO 0+N,0+N:NEXT N
NS 230 FOR N=20 TO 80 STEP 5:PLOT N,N:DRA
       WTO 319-N,0+N:DRAWTO 319-N,191-N:DRAWT
       O 0+N,191-N:DRAWTO 0+N,0+N:NEXT N
SN 240 FOR ANG=0 TO 6.3 STEP 0.1:E=SIN(AN
       G)*45:D=COS(ANG)*90:PLOT D+160,E+96:DR
       AWTO -D+160,-E+96:NEXT ANG
MB 300 REM SAVE PIC.DAT
GA 310 SLOC=PEEK(88)+PEEK(89)*256:CLOSE #
       1:OPEN #1,8,0,"D:PIC.DAT":REM SLOC MUS
       T BE FOUND AFTER GRAPHICS 8 COMMAND**
BT 320 X=USR(ADR(SAV$),SLOC,7680):CLOSE #
       1:? "DONE!":END
```

print your own return address stickers

LABEL MAKER

Article on page 19.

LISTING 1

```
PJ 1 REM ADDRESS LABEL MAKER
YB 2 REM BY WILLIAM W. WATSON
QK 3 REM ANTIC MAGAZINE
MI 10 SETCOLOR 2,13,4
NF 20 DIM BD$(1),N$(27),S$(27),CZ$(27),TB
     $(27),TC$(13),QQ$(3)
GY 30 CLOSE #3:OPEN #3,4,0,"K"
LB 40 POKE 752,0:POSITION 2,20:? "↖":? :?
      "FOR BORDER":? "    PRESS DESIRED KEY
       >";:GET #3,K
WY 50 IF K<32 OR K>122 THEN 40
TU 60 BD$=CHR$(K)
DA 70 PRINT "↖":POKE 752,1
BO 80 FOR T=0 TO 39:POSITION T,0:PRINT BD
     $:NEXT T
LA 90 FOR T=0 TO 16:POSITION 39,T:PRINT B
     D$:NEXT T
LX 100 FOR T=39 TO 0 STEP -1:POSITION T,1
     6:PRINT BD$:NEXT T
PV 110 FOR T=16 TO 0 STEP -1:POSITION 0,T
     :PRINT BD$:NEXT T
TP 120 FOR T=1 TO 13:TC$(T,T)=BD$:NEXT T
RP 130 POSITION 5,3:PRINT TC$;"   ";TC$
BH 140 FOR T=4 TO 6:POSITION 4,T:PRINT BD
     $;" 3 LINE           ";BD$;" ";BD$;"   25 LE
     TTERS  ";BD$:NEXT T
UF 150 POSITION 5,7:PRINT TC$;"   ";TC$
VN 160 POSITION 5,9:PRINT TC$;"   ";TC$
TO 170 FOR T=10 TO 12:POSITION 4,T:PRINT
     BD$;" 4 TO  LABEL ";BD$;" ";BD$;" GEMI
     NI 10X   ";BD$:NEXT T
QB 180 POSITION 5,13:PRINT TC$;"   ";TC$
OF 190 CLOSE #3:OPEN #3,4,0,"K"
FP 200 TRAP 200:POSITION 2,20:PRINT "IS T
     HIS ALL RIGHT (Y/N)":PRINT "FOR SPECIA
     L CHARACTER PRESS ESCAPE ";:GET #3,K
WH 210 IF K=89 THEN 290
OH 220 IF K=27 THEN 250
SX 230 IF K=78 THEN 280
LZ 240 GOTO 200
HT 250 POSITION 2,20:PRINT "
      "
LT 260 POSITION 2,20:PRINT "ENTER SPECIAL
      CHARACTER #XXX";:INPUT CHR
JH 270 BD$=CHR$(CHR):GOTO 70
WB 280 FOR T=1 TO 100:NEXT T:GOTO 40
WA 290 GOSUB 840
QX 300 POSITION 10,1:FOR T=1 TO 27:TB$(T,
     T)=BD$:NEXT T:PRINT TB$
AX 310 POSITION 9,2:PRINT BD$;"
                        ";BD$
BP 320 POSITION 9,3:PRINT BD$;"
                        ";BD$
CH 330 POSITION 9,4:PRINT BD$;"
                        ";BD$
RX 340 POSITION 10,5:PRINT TB$
WJ 350 GOSUB 850:GOSUB 860:GOSUB 870:GOSU
     B 880
OB 360 CLOSE #3:OPEN #3,4,0,"K"
OR 370 POSITION 4,7:PRINT " TO EDIT PRESS
      ( 0 THRU (0=OK) 5 )";:GET #3,K
NQ 380 IF K<48 OR K>53 THEN 370
SE 390 IF K=48 THEN 460
PT 400 IF K=49 THEN GOSUB 850
NJ 410 IF K=50 THEN GOSUB 860
OV 420 IF K=51 THEN GOSUB 870
QH 430 IF K=52 THEN GOSUB 880
TO 440 IF K=53 THEN 960
PM 450 GOTO 370
QU 460 POKE 82,7:POSITION 7,8
MW 470 PRINT "╱──────────────────────╲"
TA 480 PRINT "|    <>    PRINTER     <>    |"
JX 490 PRINT "|   1 TO RETURN TO EDIT     |"
XV 500 PRINT "|   2 TO PRINT          =>  |"
SX 510 PRINT "|   NUMBER REQUIRE     #>  <|"
KP 520 PRINT "|   PRINTING           #>  <|"
JL 530 PRINT "|   DO YOU WANT MORE    Y/N |"
KW 540 PRINT "|   WANT ANOTHER LABEL  Y/N |"
YA 550 PRINT "╲──────────────────────╱"
     :POKE 82,0
KT 560 CLOSE #3:OPEN #3,4,0,"K":POSITION
     28,11:PRINT " ";:GET #3,K
LV 570 IF K<49 OR K>50 THEN 460
SQ 580 IF K=49 THEN 370
OS 590 IF K=50 AND Z=0 THEN 610
OQ 600 GOTO 630
JX 610 TRAP 980:Z=1:CLOSE #3:LPRINT ;CHR$
     (27);CHR$(36);CHR$(0);
ID 614 REM ALTER THE FOLLOWING PRINTER
     CODES TO MATCH YOUR PRINTER'S EQUIV-
     ALENT OF:
OV 615 REM CONDENSED, SUPERSCRIPT AND
     LINE FEED OF 12/144
EV 620 LPRINT ;CHR$(15);:LPRINT ;CHR$(27)
     ;CHR$(83);CHR$(0);:LPRINT ;CHR$(27);CH
     R$(51);CHR$(12);
FD 630 TRAP 980:POSITION 27,12:PRINT "
     ":POSITION 27,12:INPUT QQ$:POSITION 27
     ,12:PRINT ">":QQ=VAL(QQ$):Q=0
BG 635 IF QQ=0 THEN 460
TO 640 CLOSE #3:OPEN #3,4,0,"K":POSITION
     6,17:POKE 752,1:PRINT "SET PRINTER TOP
      OF LABEL AND PRESS ANY KEY TO RUN"
HQ 650 GET #3,K
```

```
KO 660 POSITION 6,17:PRINT "
                                    "
VX 670 FOR Q=QQ TO 1 STEP -1
PH 680 POSITION 28,13:PRINT "   ":POSITIO
   N 28,13:PRINT Q
KV 690 FOR D=1 TO 2
XF 700 LPRINT
UO 710 LPRINT " ";TB$;"   ";TB$
NX 720 LPRINT BD$;N$;BD$;" ";BD$;N$;BD$
XA 730 LPRINT BD$;S$;BD$;" ";BD$;S$;BD$
JP 740 LPRINT BD$;CZ$;BD$;" ";BD$;CZ$;BD$
UW 750 LPRINT " ";TB$;"   ";TB$
EL 760 NEXT D
NV 770 IF Q=1 THEN POSITION 28,13:PRINT "
      ◣◣"
JP 780 NEXT Q
ZE 790 POKE 752,0:CLOSE #3:OPEN #3,4,0,"K
   ":POSITION 30,14:PRINT "N";:GET #3,K
SV 800 IF K=89 THEN 630
RR 810 CLOSE #3:OPEN #3,4,0,"K":POSITION
   30,15:PRINT "N";:GET #3,K
DU 820 IF K=89 THEN 30
WJ 830 LPRINT "←@";CHR$(27);CHR$(36);CHR$
   (0):CLOSE #3:PRINT "↖":END
CC 840 PRINT "↖":POSITION 10,0:PRINT "321
   0987654321X1234567890123":RETURN
ID 850 POKE 752,0:POSITION 0,2:PRINT "1 N
   AME =>";:INPUT N$:RETURN
ZT 860 POSITION 0,3:PRINT "2 STREET>";:IN
   PUT S$:RETURN
KR 870 POSITION 0,4:PRINT "3 CITY,=>":POS
   ITION 0,5:PRINT "ST,ZIP":POSITION 9,4:
   INPUT CZ$:RETURN
XV 880 POSITION 0,6:PRINT "4 BORDER=>";"
   ";BD$;"    5 SPECIAL CHR.=>";:POSITION
   10,6:INPUT BD$
AT 890 POSITION 10,6:PRINT BD$;" "
WF 900 FOR T=1 TO 27:TB$(T,T)=BD$:NEXT T
PH 910 POSITION 10,1:PRINT TB$
UA 920 POSITION 9,2:PRINT BD$;N$;BD$
AC 930 POSITION 9,3:PRINT BD$;S$;BD$
QD 940 POSITION 9,4:PRINT BD$;CZ$;BD$
MP 950 POSITION 10,5:PRINT TB$:RETURN
IV 960 POSITION 30,6:INPUT CHR
JF 970 BD$=CHR$(CHR):GOSUB 890:GOTO 370
TW 980 FOR T=1 TO 6:POSITION 6,18:PRINT "
   SOMETHING   OFF◣":NEXT T
BF 990 POSITION 6,18:PRINT "
             ":GOTO 460
```

LISTING 2

```
ND 170 FOR T=10 TO 12:POSITION 4,T:PRINT
   BD$;" 1 TO LABEL  ";BD$;" ";BD$;"     GE
   MINI 10X ";BD$:NEXT T
QV 620 REM
RJ 690 REM
GQ 710 LPRINT " ";TB$
GU 720 LPRINT BD$;N$;BD$
JY 730 LPRINT BD$;S$;BD$
RF 740 LPRINT BD$;CZ$;BD$
GY 750 LPRINT " ";TB$
RE 760 REM
```

assembly language

KEY BOARD COMMANDER

Article on page 67.

LISTING 1

```
JW 10 REM KEYCOMMD.BAS
UX 20 REM BY PAUL DRIVER
RH 30 REM ANTIC MAGAZINE
MO 40 RESTORE 110:DIM A$(1)
IU 50 ? "↖Please insert DOS 2.0S disk":?
   "and PRESS [RETURN].":INPUT A$
KP 60 ? "↖Creating AUTORUN.SYS file."
BL 70 OPEN #1,8,0,"D:AUTORUN.SYS"
YM 80 FOR X=1 TO 201:READ A:PUT #1,A:NEXT
   X
RI 90 PUT #1,226:PUT #1,2:PUT #1,227:PUT
   #1,2:PUT #1,158:PUT #1,6
KX 100 CLOSE #1
EY 110 DATA 255,255,0,6,155,6
```

```
UR 60 ? "↓Press [RETURN] when ready.":INP
   UT B$
PY 70 B$(1,1)="♥":B$(256)=B$:B$(2)=B$
NV 80 ? "↖Please wait..."
IB 90 S=ADR("h▙◆▐♥▖▛▜'▐ ▀B┘h▣E┘h▣D┘h▣I┘h▣
   H┘ V▣◆┐▄C┘▖▛◆♥")
UB 100 RESTORE 160
DF 110 FOR X=1 TO 201:READ A:B$(X,X)=CHR$
   (A):NEXT X
CG 120 ? "Creating BOOT cassette now."
BC 130 POKE 764,12:OPEN #1,8,128,"C:"
PD 140 Z=USR(S,ADR(B$),256)
LH 150 CLOSE #1
PG 160 DATA 0,2,250,5,0,6
```

LISTING 2

```
JH 10 REM KEYCOMMC.BAS
UX 20 REM BY PAUL DRIVER
RH 30 REM ANTIC MAGAZINE
VD 40 DIM B$(256)
CK 50 ? "↖Please insert cassette into rec
   order":? "as instructed in the article
   ."
```

LISTING 3

```
SQ 190 REM KEYDATA.LST
TA 200 DATA 169,6,133,13,169,181,133,12,1
   69,6,133,11,169,187,133,10,169,60,141
XA 210 DATA 2,211,169,7,162,6,160,111,32,
   92,228,169,6,141,156,6,169,0,141
EX 220 DATA 157,6,169,7,141,156,6,169,56,
```

continued on next page

```
    141,8,2,169,6,141,9,2,96,173
BC 230 DATA 9,210,205,242,2,208,5,173,241
    ,2,208,35,173,9,210,201,159,208,10
WI 240 DATA 173,255,2,73,255,141,255,2,17
    6,18,13,157,6,141,252,2,141,242,2
XW 250 DATA 169,3,141,241,2,169,0,133,77,
    169,48,141,43,2,104,64,173,31,208
XT 260 DATA 41,6,205,156,6,240,23,141,156
    ,6,73,6,10,10,10,10,10,77,157
DO 270 DATA 6,141,157,6,240,2,9,4,141,200
    ,2,173,157,6,13,252,2,141,252
MR 280 DATA 2,76,98,228,158,6,192,6,165,1
    2,141,182,6,165,13,141,183,6,165
BC 290 DATA 10,141,188,6,165,11,141,189,6
    ,76,0,6,32,0,6,76,0,6,32
HB 300 DATA 0,6,76,0,6
```

LISTING 4

```
10 ; KEYCOMM.ASM
20 ; BY PAUL DRIVER
30 ; ANTIC MAGAZINE
40 ATRACT =    $4D
50 VKEYBD =    $0208
60 SRTIMR =    $022B
70 COLBAK =    $02C8
80 INITAD =    $02E2
90 KEYDEL =    $02F1
0100 CH1 =     $02F2
0110 CH  =     $02FC
0120 SSFLAG = $02FF
0130 CONSOL = $D01F
0140 KBCODE = $D209
0150 SETVBV = $E45C
0160 XITVBV = $E462
0170      *=  $0600
0180 ;INITIALIZATION ROUTINE
0190 INIT LDA #PINIT/256
0200        STA $0D
0210        LDA #PINIT&255
0220        STA $0C
0230        LDA #DVINT/256
0240        STA $0B
0250        LDA #DVINT&255
0260        STA $0A
0270        LDA #60       ; turn off the
0280        STA $D302     ; cassette motor
0290        LDA #7        ; DEFERRED VBLANK
0300        LDX # >VBVRTN
0310        LDY # <VBVRTN
0320        JSR SETVBV
0330        LDA #6        ; INITIALIZE OLD
0340        STA OLD
0350        LDA #0        ; INITIALIZE LOCK
0360        STA LOCK
0370        LDA #7
0380        STA OLD
0390        LDA # <KYBDINT ;point to our
0400        STA VKEYBD  ;    keyboard
0410        LDA # >KYBDINT ;interrupt
0420        STA VKEYBD+1 ;   routine
0430        RTS
0440 ;KEYBOARD INTERUPT HANDLER
0450 KYBDINT LDA KBCODE
0460        CMP CH1
0470        BNE PIRQ3
0480        LDA KEYDEL
0490        BNE PIRQ4
0500 PIRQ3 LDA KBCODE
0510        CMP #$9F      ;CTRL-1
0520        BNE PIRQ1
0530        LDA SSFLAG
0540        EOR #$FF
0550        STA SSFLAG
0560        BCS PIRQ4
0570 PIRQ1 ORA LOCK   ;OUR CUSTOMIZATIO
N
0580        STA CH
0590        STA CH1
0600        LDA #3
0610        STA KEYDEL
0620        LDA #0
0630        STA ATRACT
0640 PIRQ4 LDA #$30
0650        STA SRTIMR
0660 PIRQ2 PLA
0670        RTI
0680 ;VERTICAL BLANK ROUTINE
0690 VBVRTN
0700        LDA CONSOL   ;get console key
0710        AND #6       ;mask SELECT/OPTI
ON
0720        CMP OLD      ;has it changed?
0730        BEQ EXIT     ;branch if not
0740        STA OLD      ;hold new value
0750        EOR #6       ;invert bits
0760        ASL A        ;move to MSB
0770        ASL A
0780        ASL A
0790        ASL A
0800        ASL A
0810        EOR LOCK     ;toggle value
0820        STA LOCK     ;hold onto new va
l
0830        BEQ SKIP     ;branch if 0
0840        ORA #4       ;turn up luminanc
e
0850 SKIP STA COLBAK
0860 EXIT LDA LOCK   ;Added for repeat
0870        ORA CH       ;feature
0880        STA CH
0890        JMP XITVBV
0900 OLD *=  *+1
0910 LOCK *= *+1
0920 PATCH LDA $0C
0930        STA PINIT+1
0940        LDA $0D
0950        STA PINIT+2
0960        LDA $0A
0970        STA DVINT+1
0980        LDA $0B
0990        STA DVINT+2
1000        JMP INIT
1010 PINIT JSR INIT
1020        JMP INIT
1030 DVINT JSR INIT
1040        JMP INIT
1050        *=  INITAD
1060        .WORD PATCH
```

game of the month

THIEF

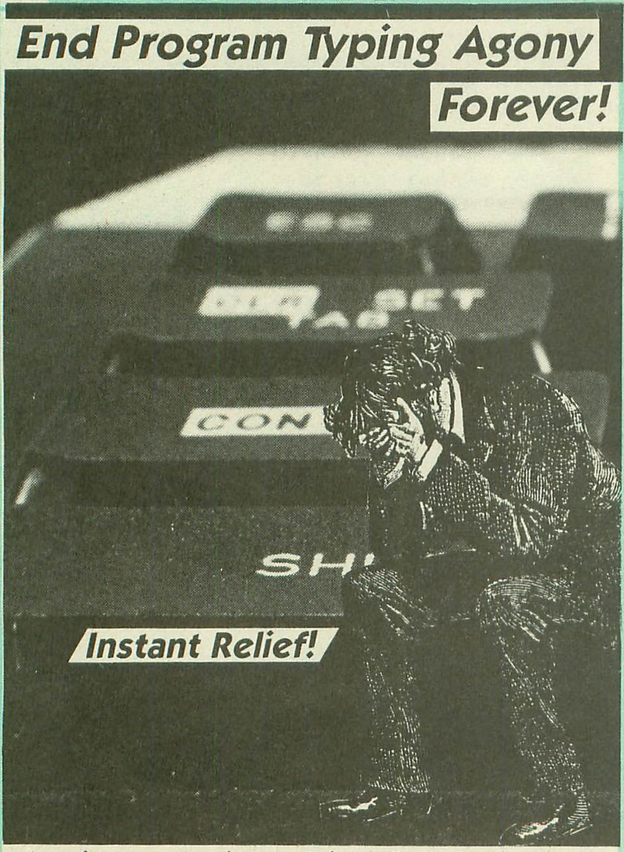
Article on page 46.

LISTING 1

```
QV 1 REM THIEF
PU 2 REM BY MAX LANGERT
QK 3 REM ANTIC MAGAZINE
MD 8 GOSUB 7000
PL 10 S=STICK(0):POKE 53278,255:SOUND 2,1
   99,10,2:SOUND 3,200,10,2:EN=EN-3:SC=SC
   +1
HO 11 POKE 77,0
UZ 12 POKE 53248,A
ZL 13 IF TR=1 THEN FA=GR:GOTO 15
BB 14 Q=Q+GR+1:FA=0
ZV 15 IF PEEK(53252)=1 THEN SOUND 0,255,8
   ,12:FOR Z=1 TO 9:NEXT Z:FOR Z=1 TO 9:E
   N=EN-5:NEXT Z:GOSUB 200
LI 16 IF PEEK(53252)=2 THEN 3000
IT 17 IF PEEK(53252)=4 THEN TR=1:TRE=TRE+
   1:GOSUB 5000
VM 18 IF TR=0 THEN 20
RT 19 IF S=13 THEN Q=Q+2
KL 20 IF S=14 THEN Q=Q-2-GR+FA
VY 21 IF S=10 THEN Q=Q-2-GR+FA:A=A-3
AV 22 IF S=6 THEN Q=Q-2-GR+FA:A=A+3
ER 23 IF S=5 THEN A=A+3
HP 24 IF S=9 THEN A=A-3
DT 25 IF PEEK(53252)=8 THEN E=1:GOSUB 250
   0
FP 26 IF S=7 THEN A=A+3
XB 27 IF S=11 THEN A=A-3
PO 34 RESTORE 1280
OI 35 FOR I=START+580+Q TO START+588+Q:RE
   AD X:POKE I,X:NEXT I:POKE 53278,255:PO
   KE 53248,A
UE 36 POSITION 11,1:? #6;EN;"D":POSITION
   13,21:? #6;SC:POSITION 18,1:? #6;TRE
PE 37 IF EN<1 THEN POSITION 11,1:? #6;"0D
   D":GOTO 3000
YP 50 IF A>201 AND TR=1 THEN RO=RO+1:E=0:
   TR=0:A=46:LI=490+10*RO:GOSUB 6000:GOSU
   B 700
DB 55 IF A<46 THEN A=46
CW 56 IF A>202 THEN A=202
RQ 90 GOTO 10
AC 200 RESTORE 1280
ZC 205 FOR Z=A TO 46 STEP -0.5:POKE 53248
   ,Z:SOUND 0,Z*2,12,8:NEXT Z
FD 210 IF Q>23 THEN Q=21
PQ 211 IF Q<-45 THEN Q=-42
ZD 220 A=46:SOUND 0,0,0,0:GOTO 34
XK 369 EN=1000:SH=3
ZC 500 DATA ]DD&']('}&(']()&DD'], *.
           -., +/                 +;, *.   q u
         v  *<, -<  =!#$%#$!%#$D/
CX 502 DATA "+.  >&']('}&(']{e, -/, +;, *
   D!#$%?  quw=?, >(DD&(e  =!#D;,    -<  u
     *D&]e,    +D!$?  -<,    >&()e   +;
CS 504 DATA """"""""""""""""+;   v =!e,""""""""""""""""
   ""*D#$%!D;, =?quvwu  -D&'](e, +D!#$%/
    *;, -DDDDD<   +/
VC 506 DATA !DDDDDDD#$DD!#%$#%!#
CC 507 IF TR=0 THEN POSITION 15,5:? #6;"J
   ":N=15:M=5
JC 508 IF E=0 THEN POSITION 12,15:? #6;"K
   ":NN=12:MM=15
AC 509 RETURN
KT 510 DATA &'(DDDDD&(']('}&('&],    *DDD;
   ,    +DD]e,  =DD/     =?,  -DDe     -.  v
   ,   +D<    =!DD!#?
OE 512 DATA """>]e    -D&'(D<   vu,         -
   .    */   =?,           >e    -;  *.,
         +/  */,  quvw           +.   -;
YB 514 DATA """=!#$%#$!?  -/   +<,   >]DD&'(
   ]e   +D!#D;,      +<          *DD&'e,    -.
         *D/,      +;   =?    -D.
LG 516 DATA """"""+D!#D/quw+D;    q,   vw*DDDD
   D!#$DDD%$?,%$#%DDDDDDDDDDDDDD%
IW 517 IF TR=0 THEN POSITION 6,17:? #6;"J
   ":N=6:M=17
OA 518 IF E=0 THEN POSITION 16,13:? #6;"K
   ":NN=16:MM=13
AE 519 RETURN
MF 520 DATA &'DD&'(')(&]'(&]'DD], *.
             -/,   +<                  +;,   +D!#
   $%?  qw v   +.,   >&'(')e  =!#$#%D;
GQ 522 DATA """"""""""""""""""">]DDD&'e,
         *D<,    =?   =? v   +D/,    -.   *D!#$%
   DD;,   =D.   >&'()DD&e,   *D;          *.
MM 524 DATA """>D;u           -/     =?,    -D!#$%
   ?  -/   =D<,     >'DDDD;   *;   >D/,      +D
   DD.   *;     */     +<
VB 526 DATA """""""""-DD(e   >e     +..,   =%$DD/
              +;,   -DDDD;   w           +..,!#DDDDD
   D!#$%$%#$!DD!
FN 527 IF TR=0 THEN POSITION 16,19:? #6;"
   J":N=16:M=19
ZB 528 IF E=0 THEN POSITION 16,5:? #6;"K"
   :NN=16:MM=5
AG 529 RETURN
OQ 530 DATA &DDD'()'(&'&](''(&]'(, +D., *D
   <, -D;   quvwq=?v q u, >](!#$%#%!DD%$#%
   ?,      >'DDD](''(&DDDe
KG 532 DATA """""""""""">De        >De, =?, +.
      =D?        q, -/   =%$#!DDD%$#$!?, *;
   +D&'()'](&'DD<, -<   +.              *D;
SK 534 DATA "+/   -.              *D;, +.   -D!#
   $%#$?   +D/, -<   >&']('(&e   +D., *<
              -D;, *.                    +D/
OV 536 DATA "-<qv                  -D/,!DD!#$%#%
   $!$#%!$DDD%
CS 537 IF TR=0 THEN POSITION 7,14:? #6;"J
   ":N=7:M=14
DA 538 IF E=0 THEN POSITION 4,5:? #6;"K":
   NN=4:MM=5
AI 539 RETURN
NH 540 DATA &'(DDD](DDDDD&'()&'],     +D/
   >](D/,     >]e        *;   q,           u    +;
   =#?,             =?   >e   >(e
BE 542 DATA """=$?  *<,  -D;   -.      w v     q
   ,   >'e   +/   =#!?   =?,           +;   >]D<
   -<,           *;u     */    >e
HY 544 DATA """=?   =DD?     +;w,    +/    *DD/
   =DD$?,   >e   >](e   >'&D<,
    >e,   q     u v w,   =?   =!#$%!$?q  v
JV 546 DATA """+<  *DDDDDDD!%$?,   +D#$DDDD
   DDDDDDD/,$%DDDDDDDDDDDDDDD%#
CG 547 IF TR=0 THEN POSITION 17,17:? #6;"
   J":N=17:M=17
AB 548 IF E=0 THEN POSITION 12,12:? #6;"K
   ":NN=12:MM=12
AK 549 RETURN
QI 700 RESTORE LI
XP 701 FOR A=2 TO 20:READ A$:POSITION 0,A
```

continued on next page

```
    :? #6;A$:NEXT A:GOSUB LI
QS 709 IF T=0 THEN GOSUB 2000:SOUND 0,0,0
   ,0:SOUND 1,0,0,0
BL 710 POSITION 0,0:? #6;"DDDDDDDDDDDDDD
   DDDDD":POSITION 0,1:? #6;"DDDDENERGY:D
   DDDDT:DD"
FU 715 POSITION 0,21:? #6;"DDPPDDDSCORE:D
   DDDDDD":POSITION 0,22:? #6;"DDDDDDDDDD
   DDDDDDDDDD"
ZN 717 POSITION 1+SH,21:? #6;"DD"
ZN 750 RETURN
TU 1100 DIM MM$(49)
GO 1105 MM$(1)="hh.Oh.Nh.Mh.Lh*♦♥P-  1N"
QD 1110 MM$(24)="rL @PWfOfMJPnh(1N.L @"
ZO 1115 MM$(46)="PW♦"
WT 1120 DIM KF$(465)
TA 1125 KF$(1)="♥♥♥♥♥♥♥♥♥aS▶▶▶▶▶▶♥♥♥♥♥♥♥"
OR 1130 KF$(24)="♥Fo▶▶▶▶▶▶<▶▶▶▶▶▶9y▶▶▶"
RJ 1135 KF$(46)="▶▶▶▶▶▶▶▶▶▶Sa▶▶▶▶▶▶y9▶▶▶"
DL 1140 KF$(68)="▶▶▶<▶▶▶▶▶▶oF▶▶▶▶??▶▶?"
PB 1145 KF$(90)="▶▶▶▶??▶▶?▶▶▶??▶▶▶?▶?▶▶"
FM 1150 KF$(112)="▶KKKKKXKK▶KKXC"
FQ 1155 KF$(133)="C 9G99 C S90 C"
ZH 1160 KF$(154)="y59 C CC: SS 99:"
OJ 1165 KF$(175)="A A y9CG C :"
QU 1170 KF$(196)="C C C A9 GG GG"
SM 1175 KF$(217)="KKKKKXKK▶XKF ◀▶▶▶"
TN 1180 KF$(238)="?▶▶▶?▶▶▶▶▶s KX KK"
XF 1185 KF$(259)="KX◀4 9C C:"
KZ 1190 KF$(280)="C C"
OX 1195 KF$(301)="C C"
YJ 1200 KF$(322)="99 ♥<◀BZ"
YD 1205 KF$(343)="B◀♥◀B^B^B◀"
ND 1210 KF$(364)="C C"
YZ 1215 KF$(385)="♥♥<f▶♥♥◢↑↑<>◀▶"
LV 1220 KF$(406)="C C9 9999▶♥"
YP 1225 KF$(427)="<>◀K◢↑<<◀▶▶♥◢↑↑>▶▶"
RD 1230 KF$(448)="CCC C99"
DV 1265 TM=PEEK(106):CB=TM-4:CA=CB*256:PO
   KE 106,CB-1:GRAPHICS 17
```




```
ZF 1270 X=USR(ADR(MM$),ADR(KF$),CA,1024)
RC 1275 POKE 756,CB
KC 1277 T=0:E=0:GOSUB 700
XR 1279 POKE 106,PEEK(740)
VL 1280 DATA 0,0,0,28,54,127,0,0,0
YD 1285 A=PEEK(106)-24:POKE 54279,A:START
   =256*A:POKE 559,46:POKE 53277,3
LC 1290 FOR T=START+512 TO START+1024:POK
   E T,0:NEXT T
OL 1293 RESTORE 1280
WT 1295 FOR I=START+580+Q TO START+588+Q:
   READ X:POKE I,X:NEXT I
LN 1300 POKE 623,4:POKE 704,44:A=46:POKE
   53278,255:GOTO 34
BN 2000 POSITION 0,0:? #6;"DDDDDDDDDDDDDD
   DDDDDD":POSITION 0,1:? #6;"DDDDDDDTHIE
   FDDDDDDDD"
WI 2010 POSITION 0,21:? #6;"DDDBYDMAXDLAN
   GERTDDD":POSITION 0,22:? #6;"DDDDDDDDD
   DDDDDDDDDDD"
HV 2020 DATA 121,243,90,217,108,30,102,20
   4,60,121,243,60,193,173,90,193,173,60
IW 2030 RESTORE 2020
LI 2040 FOR S=1 TO 6:READ A,B,C:SOUND 0,A
   ,10,12:SOUND 1,B,10,12:FOR Z=1 TO C:NE
   XT Z:NEXT S
SN 2050 FOR Z=12 TO 0 STEP -0.08:SOUND 0,
   193,10,Z:SOUND 1,173,10,Z:IF PEEK(5327
   9)=6 THEN RETURN
NE 2055 NEXT Z
CC 2056 POSITION 0,21:? #6;"DDDDDHITDSTAR
   TDDDDDD"
YN 2060 IF PEEK(53279)=6 THEN RETURN
NR 2065 POKE 77,0
QV 2070 GOTO 2060
KE 2500 POSITION NN,MM:? #6;" ":EN=EN+500
   :SC=SC+500:FOR Z=1 TO 8:SOUND 0,RND(0)
   *200+10,10,10:FOR W=1 TO 25:NEXT W
DZ 2510 NEXT Z:SOUND 0,0,0,0:GOTO 10
QA 3000 DATA 0,0,66,36,0,36,66,0,0,0
DC 3005 EN=1000
IT 3015 RESTORE 3000
NF 3020 FOR I=START+580+Q TO START+588+Q:
   READ X:POKE I,X:NEXT I:SOUND 1,0,0,0:S
   OUND 2,0,0,0:SOUND 3,0,0,0
CA 3030 FOR Z=1 TO 25:SOUND 0,100,10,10:N
   EXT Z:SOUND 0,0,0,0:FOR Z=1 TO 100:NEX
   T Z
GE 3040 SH=SH-1:IF SH=0 THEN 3060
EY 3050 POKE 53278,255:POSITION 1+SH,21:?
    #6;"DD":SOUND 0,200,12,15:FOR Z=1 TO
   10:NEXT Z:SOUND 0,0,0,0:GOSUB LI
XG 3055 GOTO 1279
KG 3060 POSITION 1,8:? #6;"=!#$%#%!$#!#$#
   %!#?":POSITION 1,9:? #6;"*GAMEDTERMINA
   TION."
OP 3065 POSITION 1,10:? #6;">&'()')&)(')]
   &'('@":POSITION 0,7:? #6;"
         "
SB 3066 POSITION 0,11:? #6;"
         "
FX 3070 FOR Z=50 TO 250 STEP 2:SOUND 0,Z,
   10,5:SOUND 1,Z-1,10,10:IF PEEK(53279)=
   6 THEN POKE 53248,10:RUN
XB 3080 NEXT Z:GOTO 3070
HG 5000 FOR Z=200 TO 30 STEP -1:SOUND 0,Z
   ,10,10:SOUND 1,Z,10,10:NEXT Z:SC=SC+10
   00:POSITION N,M:? #6;" "
NW 5010 SOUND 0,0,0,0:SOUND 1,0,0,0:RETUR
   N
MQ 6000 IF LI>540 THEN LI=500:RO=1:GR=GR+
   0.5
PL 6002 FOR R=0 TO EN STEP 5:SOUND 0,100,
   10,10:SC=SC+5:POSITION 13,21:? #6;SC:S
   OUND 0,0,0,0:NEXT R
WK 6010 FOR Z=0 TO 22:POSITION 0,Z:? #6;"
                     ":NEXT Z:RETURN
JT 7000 RO=1:LI=500:DIM A$(20):SH=3:EN=10
   00
NJ 7010 GOTO 1100
```

bonus game

ZURK

Article on page 48.

LISTING 1

```
YK 5 REM ZURK
WT 6 REM BY MICHAEL KRUEGER
KH 7 REM AND JOHN SETTIES
QP 8 REM ANTIC MAGAZINE
OB 10 DIM C1(1),C2(1),J(15):GOSUB 5000:GOSUB 10000
TQ 15 FG=2000:RD=1:L=1:SP=50:RN=1:SCR=0:GY=4:OB=0:CL=0:GOSUB 5050:GOSUB 700
YG 20 POKE P1,C1(A1):FOR T=1 TO SP:NEXT T:GOSUB 100:IF P1=P2 THEN 1000
HQ 22 IF STRIG(0)=0 AND ST=0 THEN 50
HF 25 S=STICK(0):IF S=15 THEN FOR T=1 TO SP:NEXT T:GOTO 20
MM 30 AD=J(S):P1=P1+AD:IF PEEK(P1)=1 OR PEEK(P1)=12 THEN GOSUB 90:IF ST=0 THEN 350
IO 35 IF PEEK(P1)>12 THEN 1000
SW 37 IF P1>SC+219 THEN POKE OP1,0:POKE P1,3:GOTO 980
ME 40 A1= NOT (A1):POKE OP1,0:OP1=P1:GOTO 20
NA 50 Q=0:MP=P1:OM=MP+AD:IF PEEK(OM)<>131 AND PEEK(OM)<>132 AND PEEK(OM)<>0 THEN 25
XQ 55 IF PEEK(OM)=131 OR PEEK(OM)=132 THEN 500
JZ 60 MP=MP+AD:IF  NOT (PEEK(MP)) THEN POKE OM,0:POKE MP,7:OM=MP:SOUND 0,Q,0,15:Q=Q+1:GOTO 60
FY 65 SOUND 0,0,0,0:Q=0
DT 70 POKE OM,0:IF PEEK(MP)=131 OR PEEK(MP)=132 THEN 500
KE 80 RN=RN-5.0E-03:GOTO 25
GJ 90 ST=ST-1:POKE OP1,0:POKE P1,3:FOR I=15 TO 0 STEP -1:SOUND 0,10,8,I:NEXT I:RETURN
XF 100 IF ST>0 THEN 300
UR 105 IF RND(0)>0.5 THEN 130
UM 110 IF P2>P1 THEN P2=P2-1:GOTO 150
RY 120 IF P2<P1 THEN P2=P2+1:GOTO 150
MW 130 IF P2>P1 THEN P2=P2-20:GOTO 150
IX 140 IF P2<P1 THEN P2=P2+20
XN 150 A2= NOT (A2)
IX 160 IF PEEK(P2)>4 THEN P2=OP2:RETURN
HT 170 POKE OP2,0:POKE P2,C2(A2):OP2=P2
DG 180 IF ABS(P1-P2)>20 THEN RETURN
BQ 185 IF RND(0)<RN THEN RETURN
ZT 190 Q=0:MP=P2:D=-1:IF P2<P1 THEN D=+1
MN 195 OM=MP+D:IF PEEK(OM)<>0 THEN RETURN
CG 200 MP=MP+D:IF  NOT (PEEK(MP)) THEN POKE OM,0:POKE MP,135:OM=MP:SOUND 0,Q,0,15:Q=Q+1:GOTO 200
YP 210 SOUND 0,0,0,0:Q=0
AO 220 POKE OM,0:IF PEEK(MP)=3 OR PEEK(MP)=4 THEN 1000
ZE 230 RETURN
HS 300 BN=BN-10:IF BN<0 THEN POP :GOTO 1000
WM 310 SOUND 1,5,0,BN:POSITION 12,0:? #6;BN;"‾";:RETURN
BH 350 POKE OP1,0:POKE P1,3:POSITION 6,0:? #6;"SCORE";:SOUND 1,0,0,0
BU 360 IF BN>0 THEN SOUND 0,10,8,15:SCR=SCR+5:BN=BN-5:POSITION 12,0:? #6;SCR:SOUND 0,0,0,0:GOTO 360
DX 361 IF L=4 THEN 960
JH 362 CL=CL+1:IF CL=INT(L)-1 THEN CL=0:GOSUB 900:GOTO 20
UE 364 FOR I=0 TO 15 STEP 0.5:SETCOLOR 4,0,I:NEXT I
PO 365 FOR I=15 TO 0 STEP -0.5:SETCOLOR 4,0,I:NEXT I:SETCOLOR 4,9,4
PA 370 POKE P1,3:M=P1-20:OM=M:ST=4
PM 380 IF PEEK(M)<>0 THEN ST=ST-1:GOTO 385
YS 382 IF PEEK(M)=0 THEN POKE OM,0:POKE M,12:OM=M:M=M-20:SOUND 0,M,8,15:GOTO 382
HI 385 M=P1+1:OM=M
RA 390 IF PEEK(M)<>0 THEN ST=ST-1:GOTO 395
XV 392 IF PEEK(M)=0 THEN POKE OM,0:POKE M,12:OM=M:M=M+1:SOUND 0,M,8,15:GOTO 392
PQ 395 M=P1+20:OM=M
EQ 400 IF PEEK(M)<>0 THEN ST=ST-1:GOTO 405
ZS 402 IF PEEK(M)=0 THEN POKE OM,0:POKE M,12:OM=M:M=M+20:SOUND 0,M,8,15:GOTO 402
HL 405 M=P1-1:OM=M
GE 410 IF PEEK(M)<>0 THEN ST=ST-1:GOTO 415
GY 412 IF PEEK(M)=0 THEN POKE OM,0:POKE M,12:OM=M:M=M-1:SOUND 0,M,8,15:GOTO 412
VY 415 SOUND 0,0,0,0:POSITION 6,0:? #6;"BONUS":POSITION 12,0:? #6;"────────";:BN=ST*150:OP1=P1:GOTO 20
VS 500 FOR I=7 TO 0 STEP -0.1:POKE 710,14:SOUND 0,150,10,15:FOR T=1 TO I:NEXT T:SOUND 0,0,0,0:POKE 710,148
HP 510 NEXT I:POKE P2,207
BN 511 IF L=4 THEN 930
QT 512 IF L=1 THEN SCR=SCR+INT(L*100):GOSUB 900:GOTO 20
RB 513 ST=1:BN=500:POKE 710,0
HK 515 POSITION 6,0:? #6;"BONUS":POSITION 12,0:? #6;"────────";
RF 517 R=SC+INT(RND(0)*240):IF PEEK(R)<>0 THEN 517
TA 520 POKE R,1:GOTO 20
QX 700 POSITION 1,0:? #6;"────";:IF GY-1<=0 THEN RETURN
WN 710 FOR I=1 TO GY-1:POSITION I,0:? #6;"┘";:NEXT I:RETURN
WG 800 GRAPHICS 2+16:? #6:? #6:? #6;"ATTENTION PLEASE!":? #6
AN 810 ? #6;"YOU HAVE COMPLETED"
BZ 815 ? #6;"THE ZURKIAN OLYMPIC"
DB 820 ? #6;"LASERFIGHTING EVENT"
RR 825 ? #6;"SUCCESSFULLY, BUT"
PX 830 ? #6;"THERE IS ONE SMALL"
NW 835 ? #6;"PROBLEM..."
EV 840 FOR I=1 TO 5:FOR J=0 TO 15 STEP 0.1:POKE 708,J:NEXT J:NEXT I
MJ 845 GRAPHICS 2+16:? #6:? #6:? #6:? #6;"THE JUDGES CONSUMED"
WQ 850 ? #6;"A VERY LARGE AMOUNT"
ZO 855 ? #6;"OF ZURKIAN VODKA &"
XS 860 ? #6;"ARE UNFIT TO RATE"
NM 865 ? #6;"YOU PROPERLY..."
FB 870 FOR I=1 TO 5:FOR J=0 TO 15 STEP 0.
```

continued on next page

```
   1:POKE 708,J:NEXT J:NEXT I
GH 875 GRAPHICS 2+16:POSITION 0,4:? #6;"T
   HEREFORE THE RULES"
LI 880 ? #6:? #6;"REQUIRE A REMATCH!"
FS 885 FOR I=1 TO 5:FOR J=0 TO 15 STEP 0.
   1:POKE 708,J:NEXT J:NEXT I
XV 890 GOSUB 5000:GOTO 15:GOTO 15
YS 900 OB=OB+5:SP=SP-5:RD=RD+1:IF RD>6 TH
   EN RD=1:L=L+1:IF L=2 THEN SP=20:RN=1:O
   B=0
LF 910 GOSUB 5050:GOSUB 700
ZJ 920 RETURN
TL 930 FOR I=1 TO 50
OW 940 Q=SC+INT(RND(0)*240):IF PEEK(Q)<>0
    THEN 940
OY 950 POKE Q,12:NEXT I:POSITION 6,0:? #6
   ;"BONUS";:BN=3000:ST=50:GOTO 20
TO 960 COLOR 32:FOR I=0 TO 3:PLOT 10-I,11
   :PLOT 9+I,11:FOR J=0 TO 255 STEP 9-(I*
   2):SOUND 0,J,12,J/17:NEXT J:NEXT I
VX 970 SOUND 0,0,0,0:OP1=P1:GOTO 20
KY 980 FOR I=5 TO 200 STEP 5:FOR J=0 TO 2
   55 STEP I:SOUND 0,J,10,J/17:POKE 708,J
   :NEXT J:NEXT I:SETCOLOR 0,1,6
QC 990 SOUND 0,0,0,0:GOTO 800
XN 1000 SOUND 1,0,0,0:CL=0:POKE OP1,0:POK
   E P1,3
KQ 1005 FOR I=7 TO 0 STEP -0.1:POKE 708,1
   4:SOUND 0,150,10,15:FOR T=1 TO I:NEXT
   T:POKE 708,22:SOUND 0,0,0,0
WJ 1006 NEXT I:POKE P1,0:ST=0:GY=GY-1:GOS
   UB 700:IF GY>0 THEN GOSUB 5050:GOTO 20
AL 1010 GOSUB 10000:SCR=0:GOTO 15
```



```
LW 5000 GRAPHICS 2+16:POKE 559,0:L1=PEEK(
   756):L2=PEEK(106)-8:SET1=L1*256:SET2=L
   2*256:IF PEEK(SET2+130)=102 THEN 5030
JC 5010 FOR I=0 TO 511:POKE SET2+I,PEEK(S
   ET1+I):NEXT I
TM 5015 READ CHR:IF CHR=-1 THEN 5030
RS 5020 P=SET2+CHR*8:FOR I=0 TO 7:READ B:
   POKE P+I,B:NEXT I:GOTO 5015
JX 5030 SC=PEEK(88)+256*PEEK(89):POKE 756
   ,L2
LW 5040 J(15)=0:J(5)=21:J(6)=-19:J(7)=1:J
   (9)=19:J(10)=-21:J(11)=-1:J(13)=20:J(1
   4)=-20:RETURN
KE 5050 POKE 559,0:PRINT #6;"K";:COLOR 14
   3:PLOT 0,0:PLOT 19,0:PLOT 19,11:PLOT 0
   ,11:COLOR 13:PLOT 1,0:DRAWTO 18,0
WC 5053 SETCOLOR 2,0,0:SETCOLOR 0,1,6:SET
   COLOR 4,9,4:SETCOLOR 1,0,12:SETCOLOR 3
   ,0,8
WT 5055 PLOT 1,11:DRAWTO 18,11:COLOR 26:P
   LOT 0,1:DRAWTO 0,10:PLOT 19,1:DRAWTO 1
   9,10
TP 5057 COLOR 141:PLOT 5,5:DRAWTO 15,5
HF 5058 POSITION 6,0:? #6;"SCORE":POSITIO
   N 12,0:? #6;SCR:IF SCR>=FG THEN GY=GY+
   1:FG=FG+1000
CN 5060 GOSUB 700:P1=SC+30:P2=SC+210:OP1=
   P1:OP2=P2:C1(0)=3:C1(1)=4:C2(0)=131:C2
   (1)=132
BE 5062 POKE P1,3:POKE P2,131
KF 5064 FOR I=1 TO OB
ML 5065 Q=SC+INT(RND(0)*240):IF PEEK(Q)<>
   0 THEN 5065
PP 5066 POKE Q,207:NEXT I
ZX 5070 POKE 559,34:RETURN
KB 6000 DATA 1,153,102,189,102,102,189,10
   2,153
ZU 6010 DATA 3,56,184,144,254,58,58,232,1
   4
HB 6020 DATA 4,56,58,18,254,184,184,46,22
   4
RO 6030 DATA 13,0,255,255,255,255,255,255
   ,0
ZO 6040 DATA 26,126,126,126,126,126,126,1
   26,126
AM 6050 DATA 15,0,126,126,126,126,126,126
   ,0
SP 6060 DATA 12,0,34,28,20,28,34,0,0
UJ 6070 DATA 60,128,192,160,144,136,132,1
   30,129
CQ 6080 DATA 61,128,64,32,16,8,4,2,1
LM 6090 DATA 63,0,0,0,0,0,0,0,255
EM 9000 DATA -1
BE 10000 GRAPHICS 1+16:POKE 756,L2:SETCOL
   OR 4,9,4:POKE 559,0
GP 10010 ? #6:? #6
WI 10014 ? #6;" [graphics characters] "
QX 10015 ? #6;" [graphics characters]"
MI 10020 ? #6;" [graphics characters]"
VH 10030 ? #6;" [graphics characters]"
VD 10040 ? #6;" [graphics characters]"
IC 10050 ? #6;" [graphics characters]"
QO 10060 ? #6;" [graphics characters]"
WJ 10070 ? #6:? #6:? #6:? #6
TK 10180 ? #6;"     CREATED BY"
IJ 10190 ? #6;"  MICHAEL KRUEGER"
OF 10200 ? #6;"        AND"
WJ 10210 ? #6;"   JOHN SETTLES"
MH 10220 ? #6:? #6:? #6:? #6;"PRESS SPACE
    TO PLAY"
CF 10222 IF SCR>=HI THEN HI=SCR
DW 10225 ? #6:? #6;"LAST ";SCR;" HIGH ";H
   I;:POKE 559,34
AR 10230 POKE 764,255:J=0.5:I=6
GI 10240 IF PEEK(764)=33 THEN 10260
QW 10245 I=I+J:IF I>15 OR I<6 THEN J=-J:G
   OTO 10245
RX 10250 POKE 708,21-I:POKE 710,I:GOTO 10
   240
JP 10260 GRAPHICS 2+16:POKE 756,L2:RETURN
```

KEYBOARD COMMANDER

One-key [control] [shift] commands

by PAUL DRIVER

One-handed operation of keyboard commands that normally require both hands. An aid to handicapped programmers and a useful convenience for anybody! The short BASIC program works on all Atari computers of any memory size. Versions for either cassette or disk are provided, as well as the assembly language source code.

Antic Disk Subscribers ENTER "D:KEYCOMMD.LST" and follow the directions in the article.

Keyboard Commander uses Atari console keys to toggle simulated [SHIFT] and [CONTROL] key locks. I wrote it in response to the November, 1984 **Antic** I/O letter requesting help for disabled programmers who have trouble operating two-key commands such as cursor movements.

As I was testing this program, I found that it is very convenient for ANY Atari user. Now I personally use Keyboard Commander just about any time I'm programming in BASIC, assembly language, or ACTION!

GETTING STARTED

CASSETTE USERS: Type in Listings 2 and 3 together. Check them with TYPO II and SAVE. When you RUN this program it will prompt you to place a blank cassette into your recorder (make certain it is wound past the leader) and press [RETURN]. When you have done so the program will write a bootable file onto the cassette.

To use the cassette: Rewind the cassette to the same point where you started recording the information, and power up the computer while pressing down [START]. When you hear the buzzer, press [RETURN].

DISK USERS: Type in Listings 1 and 3 together. Check them with TYPO II and SAVE a backup. When you RUN the program you will be asked to insert a disk. Press [RETURN] and an AUTORUN.SYS file will be written to disk. (NOTE: Any existing AUTORUN.SYS file will be overwritten by this file.) Now when you boot that disk, the program will be installed.

Listing 4 contains the assembly language source code for Keyboard Commander. You will notice that the program uses Page Six. If you are an assembly language programmer you may wish to type in this listing and change the origin to avoid using Page Six.

LOCKING THE KEYS

The [OPTION] key now toggles the [CONTROL] lock. The [SELECT] key toggles the [SHIFT] lock. Pressing [OPTION] while the [SHIFT] lock is toggled on allows ACTION! programmers to call up the special editor functions.

The screen border changes color to aid you in keeping track of the current locking mode:

RED	SHIFT LOCK	(SELECT)
BLUE	CONTROL LOCK	(OPTION)
GREEN	BOTH LOCKS	

It is very important that you keep track of active modes by watching the border color. If you are in [SHIFT] or [CONTROL] lock and press the [<] key, the screen will be cleared.

HOW IT WORKS

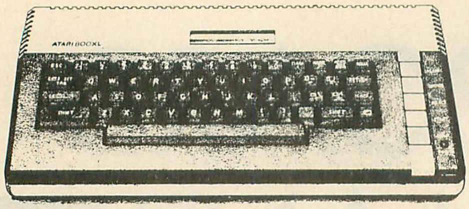
Keyboard Commander is actually a machine language routine that executes during every vertical blank period—60 times per second. Keyboard Commander monitors the console keys and toggles the value in LOCK for the border color. Then it substitutes a new keyboard interrupt routine which ANDs the value in LOCK with the value received from the keyboard hardware.

Paul Driver is an animation technician at Disney World in Florida. He grew up in the San Francisco Bay Area and got his Atari 800 at Christmas, 1979.

Listing on page 61

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PARALLEL BUS REVEALED

Part III: Building the serial i/o board

by EARL RICE

In Part Three of this important four-part series, we're ready to build a serial I/O board to take advantage of the 100,000 bytes per second data transfer speed of the Parallel Bus Interface on the Atari XL computers.

In the first two parts of this series, we learned the basic concepts of the Atari Parallel Bus Interface. This month, we'll start the actual design of a serial I/O device for the PBI. We'll choose our devices and set up the logic to allow the computer to talk to the 2K ROM or the USART that we'll use for I/O. Next month, we'll design address decoders and put software into the ROM to make things work.

Figure 1 is a block diagram of the devices we'll work with this month. Notice that the signals coming into the select logic are the same ones we invented on our block diagram last month. The exception is RST which comes directly from the PBI connector. The 2K ROM is a 2716, available from almost any surplus house. Be sure to get the 350ns version or it will be too slow for your computer.

The USART and Baud Rate Generator are from Radio Shack. See the parts list for catalog numbers. I picked this USART because it is readily available. It is also simple to design with because it has only four registers to deal with, and all are brought out to IC pins. That means we can hard-wire some functions and save writing unnecessary software. Next month we'll explain how you can make the circuit more programmable if you prefer to.

For this example, however, we'll hard-wire the control register to give us 300 baud, 7 data bits, no stop bits and no parity. *Figure 3* is a description of USART pin functions and has the information you need to change the data format. *Figure 4* and its associated table show how to change baud rate. Note that the Baud Rate Generator has to run at 16 times the baud rate you want from the USART.

The select logic bears some discussion. Because PBI timing requirements are tight, we need to use fast logic chips to be sure things work. To make matters worse, the PBI can electrically drive only one low power TTL load. When we decode addresses, we'll either need to tie two gate inputs to some lines and overload them, or put a low power buffer on the line and add an extra gate delay to our circuit. Neither alternative is very attractive.

Fortunately, there is a logic family available that combines the loading characteristics of CMOS with the speed of Schottky TTL. This combination of high speed with virtually no DC load on the PBI lines is just what we are looking for. The logic family is the 74HCTXX series. These are the parts to use here. They are exactly function and pin compatible with TTL.

Be sure to get 74HCT parts and not 74HC parts. The HCT series is a little scarce on the hobby market, but they are available. I got mine at JDR Microdevices in San Jose, California.

Figure 2 is a schematic diagram of our serial I/O device. Notice that the address lines to the 2716 ROM are left off. This is to avoid clutter. We'll put them in next month when we do address decoding. IC's 4 and 5, the NAND and NOR gates, are the select logic.

The 2K ROM is selected when the signal from the DEVICE ENABLE LATCH is LOW AND D8XX-DFXX is LOW. Follow the path through the two NOR gates. You'll notice that the second one is used as an inverter. LOWs at both pins 4 and 6 produce a LOW at pin 13, giving CHIP SELECT (CS) to the ROM.

This doesn't allow the ROM to be read, however, because its POWER DOWN (PD) line has to be brought LOW to enable the ROM outputs. The R/W signal does that every READ cycle. When it brings pin 9 of IC-4 HI, pin 10 goes LOW, enabling the ROM outputs. When both CS and PD are LOW, the ROM is on the bus.

continued on next page

We use R/W for the PD signal because its state is set at the beginning of the 6502 machine cycle, and the PD input takes about 250ns to work. If we waited for address decoding, a slow ROM might not come on quickly enough. CS operates in less than 30ns, so there's plenty of time available to wait for decoding and device enable to happen.

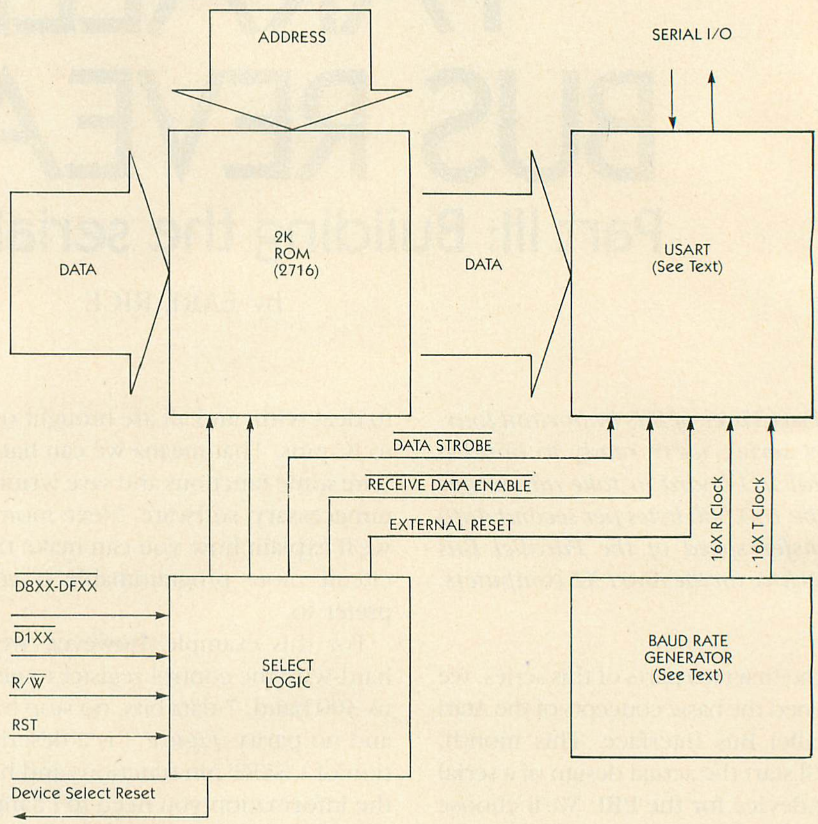
The USART is set up to operate as a single read or write register. Any address from $D100 to $D1FF will enable the USART. This wouldn't do at all if we wanted to program its control functions or read its status register. But we've hard-wired those functions for our example, so it really doesn't matter. Besides, it saves parts cost.

Next month we'll deal with embellishments. For now, writing to any address in the $D1XX range puts a character into the transmit register and the USART will send it. Reading any address in that range reads the last character received by the USART. The DS1-DS8 pins go to the transmit register, and the RD1-RD8 pins go to the receive register. We've wired them together and connected them to the data bus so the computer can write and read USART data.

When the signal from the DEVICE ENABLE LATCH is LOW at pin 3 of IC-4 AND the $D1XX signal is LOW at pin 3 of IC-4, its output goes HIGH and enables the read-write gates from IC-5. Then if R/W is HIGH at pin 1 of IC-5, pin 3 goes LOW, selecting READ DATA ENABLE (RDE) and placing the USART receive register on the bus to be read.

At the same time, pin 10 of IC-4 brings pin 12 of IC-5 LOW keeping pin 11 HIGH so the DATA STROBE (DS) of the USART is disabled. (Why isn't the ROM selected too? Because pin 13 of IC-4 is HIGH.) If R/W were LOW, pin 1 of IC-5 would be LOW and RDE would be disabled while pin 12 of IC-5 would be HIGH and DS would be enabled.

Figure 1. I/O Device Block Diagram



So that's how the select logic works. The only new signal we have is RST which comes from the PBI bus to reset the USART whenever the computer is reset. We send the buffered signal back out as DEVICE RESET (DRST) to reset the device enable latch. We'll see how that works in the final article.

In the meantime, you might want to go about scrounging parts. The circuits can be built using wire-wrap boards if you want. I prototyped on a perforated bread board and it worked fine. Leave room for another half dozen 14 pin gate IC's, a 50 pin ribbon cable header, a 9 pin D-type connector (for I/O), a 5V power connector, and a little extra for any enhancements you might want.

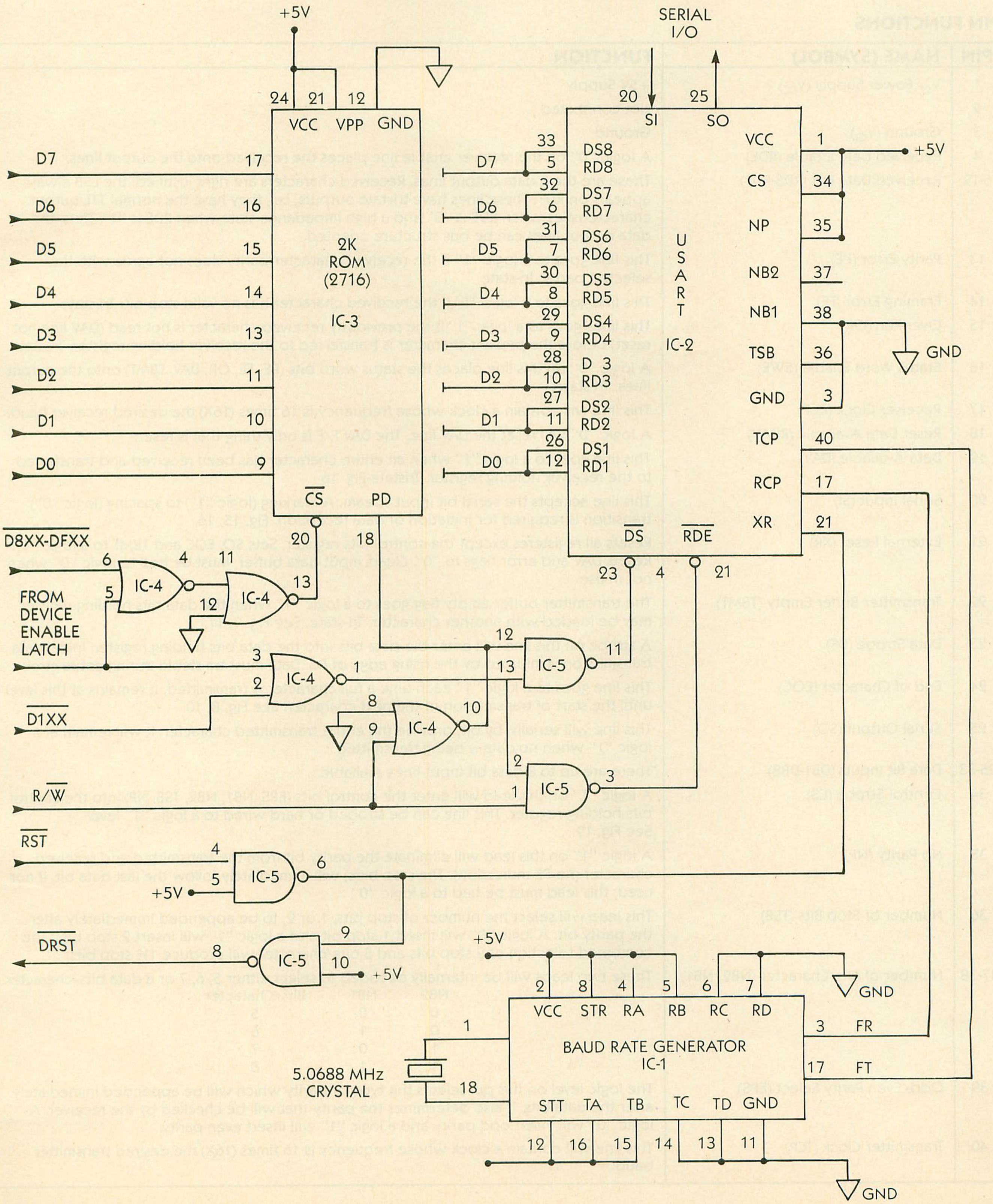
Next month we'll wrap things up with the address decoding logic, software drivers, and some suggestions for your own enhancements. See you then!

Former Atari Engineer Earl Rice was project leader for the planned top-of-the-line 1450XL computer.

PARTS LIST:

IC-1 Baud Rate Generator	Radio Shack Cat. No. 276-1795
IC-2 USART	Radio Shack Cat. No. 276-1794
IC-3 EPROM	2716-1 (350ns or faster)
IC-4 Quad 2-input NOR	74HCT02
IC-5 Quad 2-input NAND	74HCT00
CRYSTAL 5.066MHz	

Figure 2. I/O Device Schematic



continued on next page

Figure 3. UART Pin Functions

PIN FUNCTIONS

PIN	NAME (SYMBOL)	FUNCTION
1	V_{CC} Power Supply (V_{CC})	+5V Supply
2		Not connected
3	Ground (V_{GI})	Ground
4	Received Date Enable (RDE)	A logic "0" on the receiver enable line places the received onto the output lines.
5-12	Received Data Bits (RD8-RD1)	These are the 8 data output lines. Received characters are right justified: the LSB always appears on RD1. These lines have tristate outputs, i.e., they have the normal TTL output characteristics when RDE is "0" and a high impedance state when RDE is "1". Thus, the data output lines can be bus structure oriented.
13	Parity Error (PE)	This line goes to a logic "1" if the received character parity does not agree with the selected parity. Tri-state.
14	Framing Error (FE)	This line goes to a logic "1" if the received character has no valid stop bit. Tri-state.
15	Over-Run (OR)	This lines goes to a logic "1" if the previously received character is not read (DAV line not reset) before the present character is transferred to the receiver holding register. Tri-state.
16	Status Word Enable (SWE)	A logic "0" on this line places the status word bits (PE, FE, OR, DAV, TBMT) onto the output lines. Tri-state.
17	Receiver Clock (RCP)	This line will contain a clock whose frequency is 16 times (16X) the desired receiver baud.
18	Reset Data Available (RDAV)	A logic "0" will reset the DAV line. The DAV F/F is only thing that is reset.
19	Data Available (DAV)	This line goes to a logic "1" when an entire character has been received and transferred to the receiver holding register. Tristate-Fig. 16
20	Serial Input (SI)	This line accepts the serial bit input stream. A Marking (logic "1") to spacing (logic "0") transition is required for initiation of data reception. Fig. 15, 16.
21	External Reset (XR)	Resets all registeres except the control bits register. Sets SO, EOC and TBMT to a logic "1". Resets DAV and error flags to "0". Clears input data buffer. Must be tied to logic "0" when not in use.
22	Transmitter Buffer Empty (TBMT)	The transmitter buffer empty flag goes to a logic "1" when the data bits holding register may be loaded with another character. Tri-state. See Fig. 9, 11.
23	Data Strobe (DS)	A strobe on this line will enter the data bits into the data bits holding register. Initial data transmission is initiated by the rising edge of DS. Data must be stable during entire strobe.
24	End of Character (EOC)	This line goes to a logic "1" each time a full character is transmitted. It remains at this level until the start of transmission of the next character. See Fig. 8, 10.
25	Serial Output (SO)	This line will serially, by bit, provide the entire transmitted character. It will remain at a logic "1" when no data is being transmitted.
26-33	Data Bit Inputs (DB1-DB8)	There are up to 8 data bit input lines available.
34	Control Strobe (CS)	A logic "1" on this lead will enter the control bits (EPS, NB1, NB2, TSB, NP) into the control bits holding register. This line can be strobed or hard wired to a logic "1" level. See Fig. 19.
35	No Parity (NP)	A logic "1" on this lead will eliminate the parity bit from the transmitted and received character (no PE indication). The stop bit(s) will immediately follow the last data bit. If not used, this lead must be tied to a logic "0".
36	Number of Stop Bits (TSB)	This lead will select the number of stop bits, 1 or 2, to be appended immediately after the parity bit. A logic "0" will insert 1 stop bit and a logic "1" will insert 2 stop bits. The combined selection of 2 stop bits and 5 bits/character will produce 1½ stop bits.
37-38	Number of Bits/Character (NB2, NB1)	These two leads will be internally decoded to select either 5, 6, 7 or 8 data bits/character. NB2 NB1 Bits/Character 0 0 5 0 1 6 1 0 7 1 1 8
39	Odd/Even Parity Select (EPS)	The logic level on this pin selects the type of parity which will be appended immediately after the data bits. It also determines the parity that will be checked by the receiver. A logic "0" will insert odd parity and a logic "1" will insert even parity.
40	Transmitter Clock (TCP)	This line will contain a clock whose frequency is 16 times (16X) the desired transmitter baud.

continued on page 76

SPARE PARTS FOR YOUR ATARI

product reviews

CUTTHROATS

Infocom
55 Wheeler Street
Cambridge, MA 02138
(617) 492–1031
$34.95, 48K—disk

Reviewed by Michael Ciraolo and Jack Powell

You're about to get yourself into very deep trouble, says the **Cutthroats** packaging. It's true! The latest in Infocom's True Tales of Adventure series will trouble serious fans, due to several seemingly illogical and arbitrary key puzzles.

Set on Hardscrabble Island, Cutthroats makes you the murky port's top diver and local shipwreck expert.

A note offering adventure is slipped under your door. And as you are drawn into the adventure, you meet some real charmers—Pete the Rat, Weasel, Johnny Red. You'll need to learn how to deal with these locals. Some will kill you, some hold the key to sunken treasure and winning the game with 250 points.

There are four shipwrecks offshore and you must decide which to salvage. The game has more than one major branch and solution.

Cutthroats comes with Infocom's usual excellent packaging, including a hilarious "True Tales of Adventure Magazine", a tide chart, the "Hardscrabble Island Historical Society's Book of Shipwrecks" and so on.

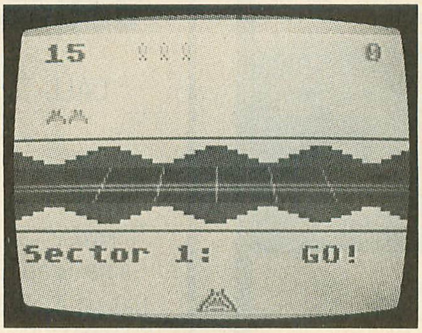
The trouble is that Cutthroats is very time dependent and does not allow extensive exploring. You must be at certain places at exact times or you will forever wander the island. You must waste time waiting for meetings and discover secret meetings.

The rigid story development made us feel as though we were being overly manipulated. There was little illusion of spontaneity.

There are plenty of puzzles, but only some are clever and appropriate to the story. Unfortunately, other puzzles are obscure, illogical and nearly clueless. Be prepared to mail away for the official invisible ink cluebook to this game.

Even when not up to the company's highest standard, Infocom text adventures are way ahead of the competition. Still, we frankly expected better from Michael Berlyn, author of the superb **Infidel.**

DREADNAUGHT FACTOR, BEAMRIDER



Beamrider

Activision, Inc.
2350 Bayshore Frontage Road
Mountain View, CA 94043
(415) 960–0410
$14.99 each (From retailers only)
16K—cartridge

Reviewed by Keith Valenza

Another **Space Invaders** clone? Not quite, although you do have to obliterate alien ships, dodge bombs and laser blasts and so on.

However, if you're a videogamer who still enjoys the thrill of annihilating the alien forces from another galaxy, **The Dreadnaught Factor** is a good bet.

The game features clear, crisp, colorful and detailed graphics. Unlike the originality of many Activision games, however, the overused concept of "kill or be killed" is not creative.

If you do want another X-T shoot-'em-up, you'll find seven levels of play and ten lives. On the screen, you'll see your joystick-controlled hyperfighter flying over the enormous Dreadnaught as you attempt to bomb guns and air vents. Only by destroying all the vents can you destroy the Dreadnaught.

In **Beamrider**, once again your joystick moves a spaceship figure from side to side as your trigger button fires lasers at alien spacecraft coming down from the top of the screen.

What keeps this overdone format from making the game a total waste of time is the 3-D effect of the beam grid playfield—it produces the same sort of illusion as the checkerboard 3-D backgrounds that have been used effectively in other current games.

If you're a real hand-eye coordination arcade whiz, you probably won't find the game's action too exciting. But as an ordinary mortal, I found my adrenalin going up as the attack saucers came at me along the Tron-like grid of beams.

HOMEPAK

Batteries Included
186 Queen Street West
Toronto, ON M5V 1Z1
(416) 596–1405
$49.95, 48K-disk

Reviewed by Jerry White

HomePak integrates three programs —word processor, filing manager and telecommunications. Programmed by Russ Wetmore, the author of Preppie, it's the friendliest personal productivity software I've ever seen, and an ideal package for serious telecommunications users. (HomePak is already used by all CompuServe Atari SIG sysops.)

The package's real gem is HomeTerm, which will work with just about any 300 baud or 1200 baud modem currently on the market. It

even lets you upload and download with the low-cost Atari 1030 and 835 modems.

HomeTerm's colorful screen has a status line displaying duplex, time, file specs and more. You can use the joystick to control common command sequences, for speed and convenience in cruising through the menus and notes of large bulletin boards. You can set up an unlimited library of automatic log-on macros. The list of HomeTerm's exceptional features just goes on and on . . .

HomeFind uses natural-language commands to search through three fields.

HomeText is an excellent simple word processor with lots of helpful bells and whistles like pop-up menus and color-coded screens, so you don't need to memorize complex commands.

You can work with files up to 8K long—about 4 pages of text. But it's easy to chain files together for convenient printing.

HomeText supports underlining and boldfacing, and has a document preview display. It comes with printer drivers for many popular printers. And it can print customized form letters with merged data from Homefind files.

HomeFind uses natural-language commands to search through three fields. You don't have to enter your records in a special format. For example, simply type in, "Antic address 524 Second Street San Francisco CA 94107." And later you could look up this information by typing, "What's Antic's address?

Obviously, HomePak is not a superpowered integrated business package like Lotus 1-2-3. But HomeFind is fine for maintaining a phone directory and other information to use with HomeTerm telecommunicating. And HomeText is fine for preparing text to upload with HomeTerm. Also, the word processor and the database by themselves are perfectly adequate for most home uses.

HomePak's documentation comes in a spiral-bound hardcover booklet that stands up on your desk like an easel, making the instructions extra easy to read. At $49.95 for a disk with three high-quality programs, HomePak could well be the year's best Atari software value.

SUPER-TEXT

MUSE Software
347 N. Charles Street
Baltimore, MD 21201
(301) 659-7212
$99, 48K—disk

Reviewed by Chris Chabris

Super-Text (MUSE) is a living dinosaur converted from an Apple word processor. It requires three seperate modes to edit text. In Add mode, you type in text and backspace to delete. To make insertions, enter the Cursor mode, position the cursor, and re-enter the Add mode. There's also a Change mode involved in typing over text. This clumsy multi-mode structure was abandoned by most programmers years ago.

Super-Text is a living dinosaur.

There are other limitations. Scrolling with the Cursor mode is slow. Super-Text allows only 14K of text, (two-fifths of Letter Perfect's memory). Super-Text can't be used with double-density disk drives.

At least Super-Text has help screens and allows extensive latitude in creating printer drivers. Documentation is comprehensive and includes a quick-reference card.

WRITERS TOOL

Optimized Systems Software, Inc.
1221B Kentwood Avenue
San Jose, CA 95129
(408) 446-3099
$129.95, 48K—disk

Reviewed by Tom Rainbow

Writer's Tool (OSS) is a better word processor than AtariWriter—but it's still not as good as Letter Perfect.

Writer's Tool requires both a disk and an 8K cartridge, it supports double-density disk drives as well as the Amdek three-inch microfloppy. It comes with print drivers for most major printers on the market. And it has a database merge feature.

Unfortunately, Writer's Tool also has several throwbacks to the early days of word processing. Functions like Search-and-Replace and Clear (before and after cursor) require leaving the Edit mode, selecting a main menu option, performing the function, and then returning to Edit mode.

Similar inconvenience is encountered in saving a file. You must hit [OPTION] to get the main menu, select [D] for Diskio functions, choose [S] for save, and discover that the program only saves text after the cursor. If your cursor isn't at the text's start, you'd best go back and put it there.

Writer's Tool also takes up too much memory, leaving about 18K for files. You get 28K (about 4,000 words) with Letter Perfect or AtariWriter. A mere 18K isn't good for much more than writing **Antic** product reviews.

PARALLEL BUS REVEALED
continued from page 72

PIN FUNCTIONS

PIN NO.	SIGNAL	FUNCTION
1	XTAL/EXT1	Input is either one pin of the crystal package or one polarity of the external input.
2	V_{CC}	Positive power supply—normally +5V
3	f_R	This output runs at a frequency selected by the Receiver divisor select data bits.
4-7	R_A, R_B, R_C, R_D	These inputs, as shown in Table 1, select the receiver output frequency, f_R.
8	STR	A high level input strobe loads the receiver data (R_A, R_B, R_C, R_D) into the receiver divisor select register. This input may be strobed or hard-wired to a high level.
9	NC	
10	NC	
11	GND	Ground
12	STT	A high level input strobe loads the transmitter data (T_A, T_B, T_C, T_D) into the transmitter divisor select register. This input may be strobed or hard-wired to a high level.
13-16	T_D, T_C, T_B, T_A	These inputs, as shown in Table 1, select the transmitter output frequency f_T
17	f_T	This output runs at a frequency selected by the Transmitter divisor select data bits.
18	XTAL/EXT2	This input is either the other pin of the crystal package or the other polarity of the external input.

Figure 4.

REFERENCE FREQUENCY=4.915200MHz

Divisor Select DCBA	Desired Baud Rate	Clock Factor	Desired Frequency (KHz)	Divisor	Actual Baud Rate	Actual Frequency (KHz)	Deviation
0000	50.00	16X	0.80000	6144	50.00	0.800000	0.0000%
0001	75.00	16X	1.20000	4096	75.00	1.200000	0.0000%
0010	110.00	16X	1.76000	2793	109.93	1.758983	0.0100%
0011	134.50	16X	2.15200	2284	134.50	2.152000	0.0000%
0100	150.00	16X	2.40000	2048	150.00	2.400000	0.0000%
0101	300.00	16X	4.80000	1024	300.00	4.800000	0.0000%
0110	600.00	16X	9.60000	512	600.00	9.600000	0.0000%
0111	1200.00	16X	19.20000	256	1200.00	19.200000	0.0000%
1000	1800.00	16X	28.80000	171	1796.49	28.743859	0.1949%
1001	2000.00	16X	32.00000	154	1994.81	31.916883	0.2697%
1010	2400.00	16X	38.40000	128	2400.00	32.000000	0.0000%
1011	3600.00	16X	57.60000	85	3614.11	57.825882	0.3921%
1100	4800.00	16X	76.80000	64	4800.00	76.800000	0.0000%
1101	7200.00	16X	115.20000	43	7144.19	114.306976	0.7751%
1110	9600.00	16X	153.60000	32	9600.00	153.600000	0.0000%
1111	19200.00	16X	307.20000	16	19200.00	307.200000	0.0000%

REFERENCE FREQUENCY=5.068800MHz

Divisor Select DCBA	Desired Baud Rate	Clock Factor	Desired Frequency (KHz)	Divisor	Actual Baud Rate	Actual Frequency (KHz)	Deviation
0000	50.00	16X	0.80000	6336	50.00	0.800000	0.0000%
0001	75.00	16X	1.20000	4224	75.00	1.200000	0.0000%
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1010	2400.00	16X	38.40000	132	2400.00	38.400000	0.0000%
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1100	4800.00	16X	76.80000	66	4800.00	76.800000	0.0000%
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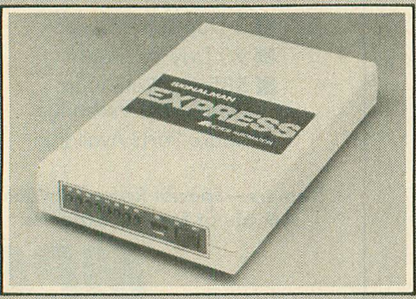
new products

VOLKSMODEM 12 MODEM
SIGNALMAN EXPRESS MODEM

(modems)
Anchor Automation, Inc.
6913 Valjean Ave.
Van Nuys, CA 91406
(818) 997-6493
$299 (Volksmodem)
$439 (Signalman)

Anchor's two new modems are both 300/1200 baud. The Volksmodem is a smart modem featuring autodial and auto-answering, dial tone detect, and busy detection. It requires an RS-232 interface or special cables to circumvent the Atari 850 interface.

The Express does everything the Volks-



modem 12 does, but it also has a built-in speaker for audio line monitoring, volume control, configuration switches for switched phone networks, permanent phone number storage, autodial. With a full array of indicator lights, this rivals the Hayes 1200 Smartmodem in specifications.

PAPER CLIP

(word processor)
Batteries Included
17875 Sky Park North
Suite P
Irvine, CA 92714
(714) 250-8723
48K—disk
$89.95

The highly acclaimed PaperClip word processor comes to the Atari with some spectacular new features. Batteries Included claims it will have dual window/dual file editing, auto-save for work in progress, single key saving and a print preview mode. (Psst, here's a secret for **Antic** readers. This software is apparently an expanded version of the high-powered ACTION! editor.)

SUSPECT
THE HITCHHIKER'S GUIDE TO THE GALAXY

(games)
Infocom
55 Wheeler Street
Cambridge, MA 02138
(617) 492-1031
48K—disk
$39.95 each

Suspect is Infocom's third detective thriller. In this case, you're suspected of a murder and must prove your innocence.

Don't Panic! Douglas Adams, author of the mindbogglingly funny Hitchhikers series, has written an Infocom version largely composed of new material. You play the role of Authur Dent, a hapless earthling travelling the universe following the destruction of Earth.

VPI 160
HSA 110

(accessories)
Video Peripherals Inc.
1667 West Ninth Street
Long Beach, CA 90813
(213)437-4883
VPI 160—$7.95
HSA 110—$5.29

The VPI is a six-foot monitor cable designed for the Atari. At one end is a DIN plug. The other end branches to a variety of RCA and mini-jacks. Also comes in gold-plated version.

According to the company, the HSA is "a gripper ball and extension stick kit" to improve your Atari joystick. It instantly improves your ability to score and reduces hand fatigue—just snap it on and play.

NEW IMPROVED MASTERTYPE

(software)
Scarborough Systems
25 N. Broadway
Tarrytown, NY, 10591
(800) 882-8222
cartridge
$39.95

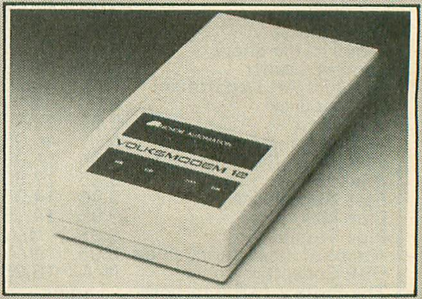
America's top typing program has been revised to include finger positioning exercises and sentence practice, as well as the original action graphics format.

CONAN
LOST TOMB

(games)
Datasoft
19808 Nordhoff Place
Chatsworth, CA 91311
(818) 701-5161
48K—disk
$39.95 (Conan)
$34.95 (Lost Tomb)

The hero of fiction, film and comics is now a hero of software. Join Conan as he battles monsters and demons in an ancient castle.

The Lost Tomb takes you on a journey into an Egyptian tomb infested with deadly creatures and lethal traps.



IMPERIUM GALACTUM

(game)
Strategic Simulations, Inc.
883 Stierlin Road, Bldg. A-200
Mountain View, CA 94043
(415) 964-1353
48K—disk
$39.95

Play the computer or up to three humans as you seek to increase the power of your race among 50 star systems. You can design your own legions, negotiate with independent worlds or obliterate entire planets.

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BASIC XL

"BASIC XL is a fast and powerful extension of Atari BASIC, totally compatible with virtually all software. Its many features make programming easy, especially games that require player/missile graphics. For people writing business software or translating existing programs from other computers, the new string arrays and other string-handling features make the task manageable. BASIC XL is a truly professional language that should become standard in all future Atari computers. Overall Rating—A." *The Addison-Wesley Book of Atari Software 1984*

BASIC XL SuperCartridge & Manual ***(Requires 16K Memory)*** **$79.00**

ACTION!

"For those who have found BASIC to be too slow or assembler to difficult, ACTION! is the logical alternative. ACTION! programs can increase speed from 50 to 200 times that of BASIC." *Jerry White, Antic, February 1984*

ACTION! SuperCartridge & Manual ***(Requires 16K Memory)*** **$99.00**

MAC/65

"For the serious machine language programmer or anyone interested in programming in 6502 machine language, this package is a must. A lot of the good professional software on the market, games or otherwise, was written using this brute. Coding machine language with anything else is like trying to swim upstream in quicksand." *ACE Of West Hartford, May 1984*

MAC/65 SuperCartridge & Manual ***(Requires 16K Memory)*** **$99.00**

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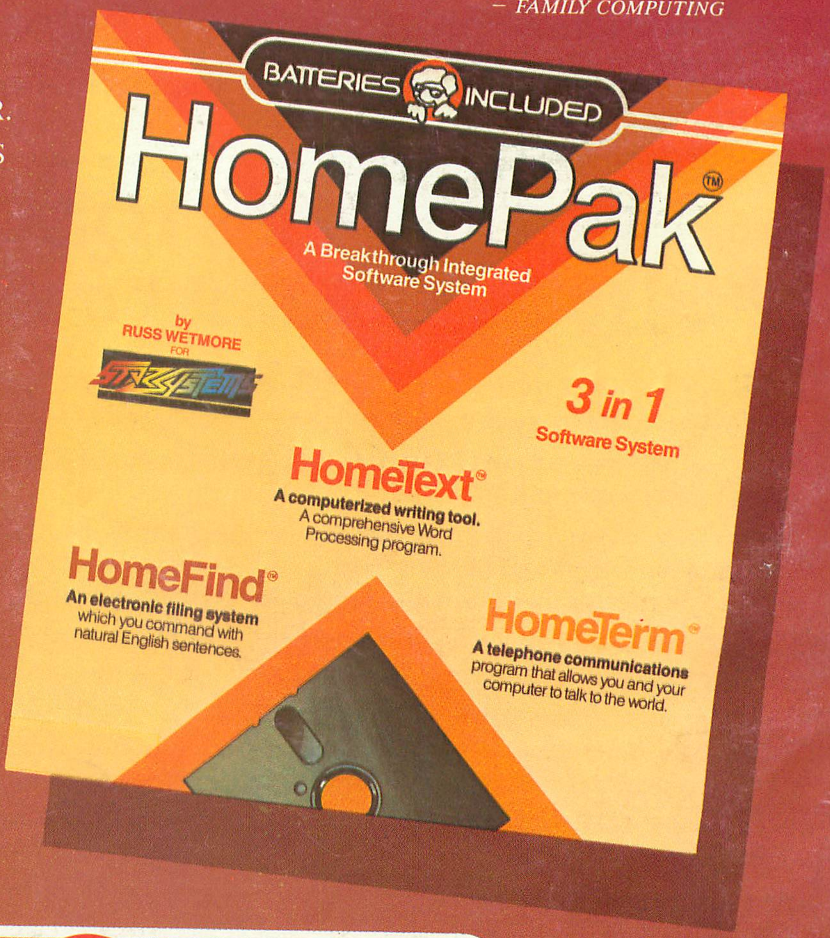
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And it's easy to use the three programs together. For example, in the "Merge" mode, you can take data stored in HOMEFIND and print letters and labels using HOMETEXT. Or, use HOMETEXT to write reports based on information you've called up via HOMETERM.



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